Toshiba Personal Computer

Satellite P300

Maintenance Manual

TOSHIBA CORPORATION

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Toshiba Personal Computer Washington- Satellite A300 Maintenance Manual

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Preface

This maintenance manual describes how to perform hardware service maintenance for the Toshiba Personal Computer Satellite A300 Series.

The procedures described in this manual are intended to help service technicians isolate faulty Field Replaceable Units (FRUs) and replace them in the field.

SAFETY PRECAUTIONS

Four types of messages are used in this manual to bring important information to your attention. Each of these messages will be italicized and identified as shown below.

> ***DANGER:*** *"Danger" indicates the existence of a hazard that could result in death or serious bodily injury, if the safety instruction is not observed.*

> ***WARNING:*** *"Warning" indicates the existence of a hazard that could result in bodily injury, if the safety instruction is not observed.*

> ***CAUTION:*** *"Caution" indicates the existence of a hazard that could result in property damage, if the safety instruction is not observed.*

> ***NOTE:*** *"Note" contains general information that relates to your safe maintenance service.*

Improper repair of the computer may result in safety hazards. Toshiba requires service technicians and authorized dealers or service providers to ensure the following safety precautions are adhered to strictly.

- Be sure to fasten screws securely with the right screwdriver. If a screw is not fully fastened, it could come loose, creating a danger of a short circuit, which could cause overheating, smoke or fire.

- If you replace the battery pack or RTC battery, be sure to use only the same model battery or an equivalent battery recommended by Toshiba. Installation of the wrong battery can cause the battery to explode.

The manual is divided into the following parts:

Chapter 1	Hardware Overview describes the Satellite A300 system unit and each FRU.
Chapter 2	Troubleshooting Procedures explains how to diagnose and resolve FRU problems.
Chapter 3	Test and Diagnostics describes how to perform test and diagnostic operations for maintenance service.
Chapter 4	Replacement Procedures describes the removal and replacement of the FRUs.
Appendices	The appendices describe the following:

- Handling the LCD Module
- Board layout
- Pin assignments
- Keyboard scan/character codes
- Key layout
- Wiring diagrams
- BIOS Rewrite Procedures
- EC/KBC Rewrite Procedures
- Reliability

Conventions

This manual uses the following formats to describe, identify, and highlight terms and operating procedures.

Acronyms

On the first appearance and whenever necessary for clarification acronyms are enclosed in parentheses following their definition. For example:

Read Only Memory (ROM)

Keys

Keys are used in the text to describe many operations. The key top symbol as it appears on the keyboard is printed in **boldface** type.

Key operation

Some operations require you to simultaneously use two or more keys. We identify such operations by the key top symbols separated by a plus (+) sign. For example, **Ctrl + Pause (Break)** means you must hold down **Ctrl** and at the same time press **Pause (Break)**. If three keys are used, hold down the first two and at the same time press the third.

User input

Text that you are instructed to type in is shown in the boldface type below:

DISKCOPY A: B:

The display

Text generated by the computer that appears on its display is presented in the typeface below:

```
Format complete
System transferred
```

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Chapter 1

Hardware Overview

Chapter 1 Contents (Intel Platform)

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Features

1.1 Features

The Satellite P300 Satellite Pro P300 (Intel Platform) series are 2 spindle PCs running
Intel® Core Duo Processor T8100 (800MHz) or higher
Intel® Core Duo Processor T9300 (800MHz) or higher.
Intel® Pentium Dual Processor T2330 or higher.
Intel® Celeron 540 Processor or higher.
Intel® Core™2 Duo Processor (667MHz) T5450 or higher.

The features are listed below.

- θ Microprocessor

Microprocessor that is used will be different by the model.
It supports processors as follows:

Intel Core2 Duo Processor

FSB : 667 MHz	T5550(1.83GHz)
	T5750(2.0GHz)
	T5850(2.16GHz
FSB : 800MHz	T8100(2.10GHz)
	T8300(2.40GHz)
	T9300(2.5GHz)
	T9500(2.6GHz)

Intel Pentium Dual

FSB :533GHz	T2330(1.6GHz)
	T2370(1.73GHz)
	T2390(1.86GHz)

Intel Celeron

FSB : 533 GHz	540(1.86GHz)
	550(2.0GHz)
	560(2.13GHz)
	570(2.26GHz)

- θ Memory

Two DDRII SO-DIMM (667MHz specification compliant) **used can be** up to 4GB (but 2GB for GL960) which can be upgraded through Memory Module Slot.

Maximum upgradeable system memory may depend on the model

- θ VRAM

  Shared with System RAM for Intel GM965, PM965,GL960, GM965 +ATI

  M82XT Graphic card:64MB,128MB,256MB.

- θ HDD(First/Second Hard Drive – SATA)

  160GB, 200GB, 250GB, 300GB, internal drives. 2.5 inch x 9.5mm height.

- θ USB FDD (Option)

  Toshiba external USB FDD for option

- θ Display

  LCD

  17-inch, 1,440 (H) x 900 (V) WXGA+ 262,144 colors + CCFL, High-brightness, amorphous silicon TFT color display..

  CRT

  Supported via a RGB connector.

- θ Keyboard

  Toshiba keyboard module has (104/105/109 keys) with three LEDs design, Support Windows keys & Application keys. Multi-langue support.

- θ New Dummy card slot

  The new card slot (dummy card) accommodates one 5mm Type II card. The slot support 16-bit PC cards.

- θ Optical devices

  A DVD Super Multi drive is equipped.

- θ Battery

  The RTC battery is equipped inside the computer.

It is good with no external power source for 1month on average.

The main battery is a detachable lithium ion battery.

6 cell Li-Ion 10.8v/4000mAh
9 cell Li-Ion 10.8v/6000mAh

- θ USB (Universal Serial Bus)

  3 USB ports are provided. The ports comply with the USB2.0 standard, which enables data transfer speeds 40 times faster than USB1.1 standard. USB1.1 is also supported.

- θ Sound system

  Internal stereo speaker, Internal MIC (Option) external monaural microphone connector, stereo headphone connector.

- θ Wireless LAN

  The wireless LAN is equipped on the mini card slot.

- θ LAN/MODEM

  Connectors for LAN and Modem are separately mounted.

- θ 1394

  One 1394 port is equipped.

- θ Multiple Digital Media Card Slot

  XD/MS/MS pro/SD/MMC are supported

- θ Bluetooth

  USB Bluetooth Module standard Ver 2.1 & EDR(Enhanced Data Rate) equipped

- θ Security

  Kensington Lock,

  Fingerprint –Enhanced Lock is also equipped.

- θ HDD Password

θ 3D Accelerometer for HDD

Front with the display open

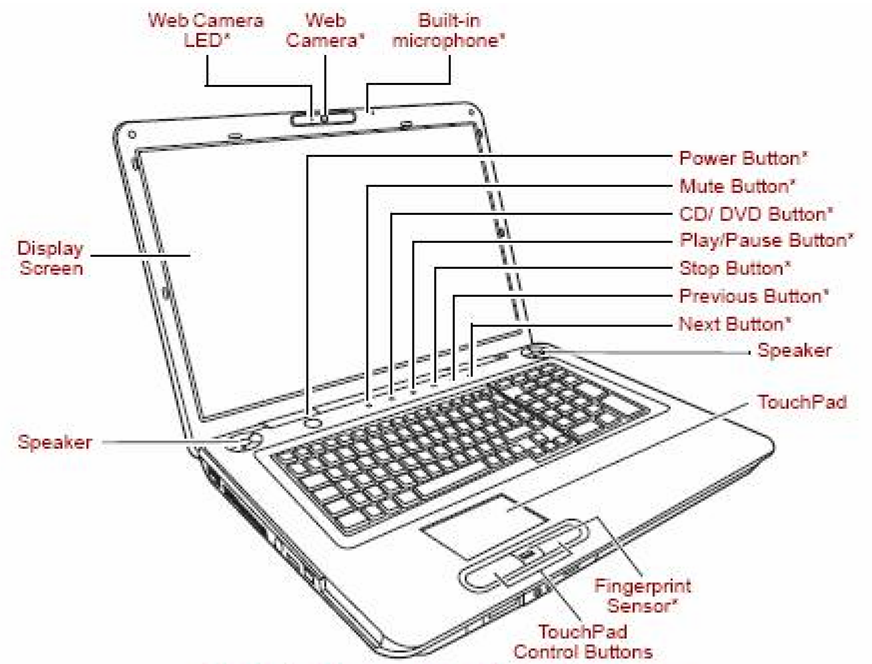


Figure 1-1 Front of the computer

1.2 System Block Diagram

Figure 1-2 shows the system block diagram.

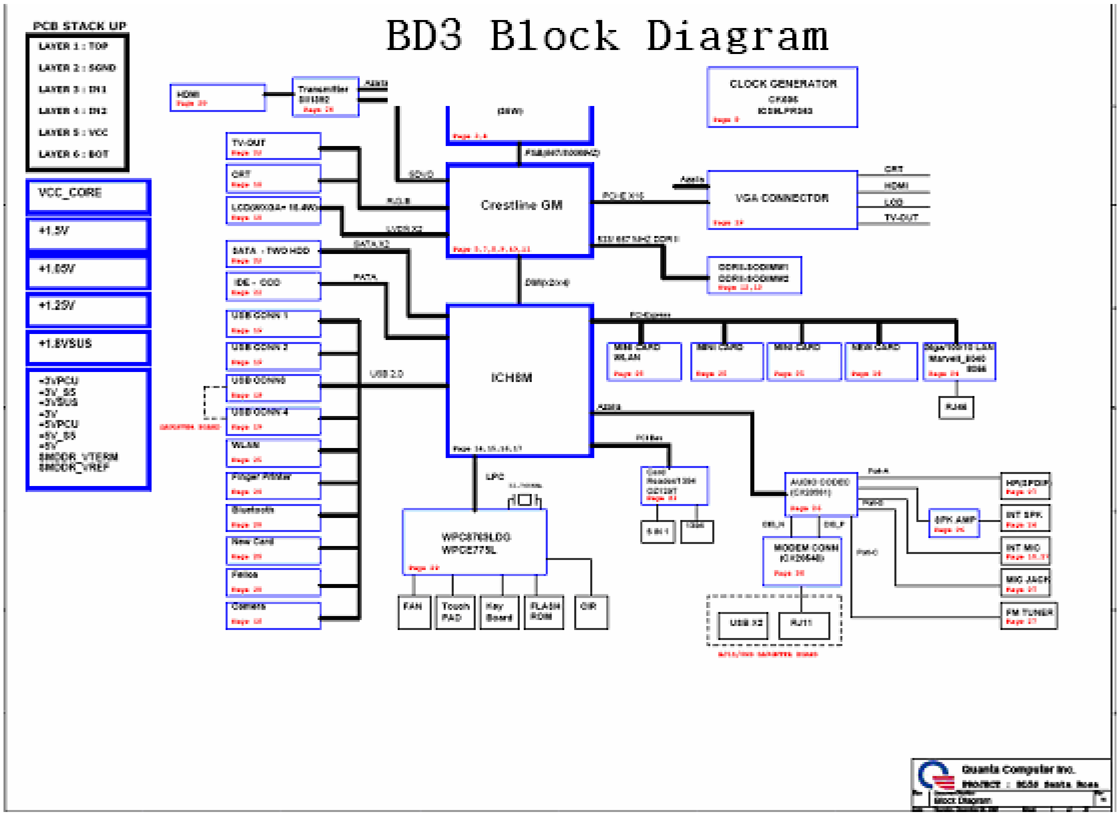


Figure 1-2 System block diagram for Intel Platform

The PC contains the following components.

θ CPU

Intel Core2 Duo Processor

FSB : 667 MHz	T5550(1.83GHz)
	T5750(2.0GHz)
	T5850(2.16GHz
FSB : 800MHz	T8100(2.10GHz)
	T8300(2.40GHz)
	T9300(2.5GHz)
	T9500(2.6GHz)

Intel Pentium Dual

FSB :533GHz	T2330(1.6GHz)
	T2370(1.73GHz)
	T2390(1.86GHz)

Intel Celeron

FSB : 533 GHz	540(1.86GHz)
	550(2.0GHz)
	560(2.13GHz)
	570(2.26GHz)

θ Memory

Two memory slots capable of accepting DDRII-SDRAM 512MB,1GB or 2GB memory modules for a maximum of 4GB(2GB for GL960).

- 200-pin SO-DIMM
- 1.8V operation

θ BIOS ROM (Flash memory)

- 8Mbit

θ Chipset (Santa Rosa Platform)

This gate array has the following elements and functions.

- North Bridge (Intel PM965,GM965/GL960)
  - Celeron processor System Bus support
  - DRAM Controller : DDRII 533/667/800 support
  - DMI
  - 1299-ball 35 x 35mm Mirco FC-BGA Package

- South Bridge (Intel 82801HBM ICH8-M)
  - Direct Media Interface (DMI)
  - PCI Express
  - Serial ATA (SATA) Controller
  - PCI Interface
  - Low Pin count (LPC) interface
  - Serial Peripheral Interface (SPI)
  - DMA controller
  - Advanced Programmable Interrupt Controller (APIC)
  - USB Controllers
  - Gigabit Ethernet Controller
  - RTC
  - GPIO
  - Enhanced Power Management
  - SMBus 2.0
  - High Definition Audio Controller
  - 676-pin 31mmx31mm mBGA Package

θ Other main system chips

- Clock Generator (ICS951462AGLFT)
- EC/KBC (Support CIR : Winbond WPCE775CA0DG)
- EC/KBC (No Support CIR : Winbond WPCE775LA0DG)
- HD Audio (CONEXANT CX20561-12Z)
- Audio AMP (GMT G1441R51U)
- 1394/Card Reader controller (O2 OZ129TN)
- 10/100 LAN controller (Marvell 88E8040T-A0-NNC1C000)
- GIGA LAN controller (Marvell 88E8072-B1-NNC1C000)

θ Mini Card

Wireless LAN card (BTO)

5.4 GHz DSSS/OFDM LAN card is equipped. Conformity with IEEE 802.11b/g, IEEE 802.11 a/g/n and IEEE 802.11a/b/g..

- θ MODEM (Conexant x 1)

  Supported by on board Modem + DAA daughter card.
  Data and FAX transmission is available.
  Supports ITU-TV.90.
  The transfer speed of data receiving is 56kbps, of data sending is 33.6kbps and of FAX is 14.4kbps. Actual speed depends on the quality of the line used.
  Connected to telephone line through RJ11 MOD

1.3 2.5-inch Hard Disk Drive

A compact, high-capacity HDD with a height of 9.5mm. Contains a 2.5-inch magnetic disk and magnetic heads.

Figure 1-3 shows a view of the 2.5-inch HDD and Tables 1-1 and 1-2 list the specifications.

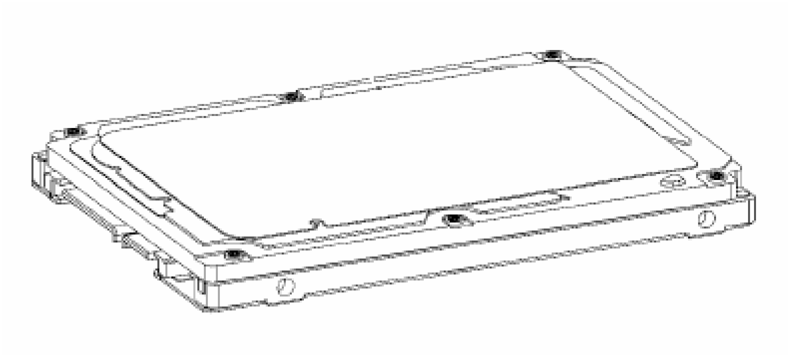


Figure 1-3 2.5-inch HDD

Table 1-1 2.5-inch HDD dimensions

Parameter		Standard value				
		TOSHIBA MK1246GSX	TOSHIBA MK1646GSX	TOSHIBA MK2046GSX	TOSHIBA MK2546GSX	TOSHIBA MK3252GSX
Outline dimensions	Width (mm)	69.85 +/- 0.25				
	Height (mm)	9.5				
	Depth (mm)	100.2 +/- 0.25				
	Weight (g)	97/98	97/98	101//102	101//102	

Parameter		Standard value			
		FUJITSU MHY2120BH	FUJITSU MHY2160BH	FUJITSU MHY2200BH	FUJITSU MHY2250BH
Outline dimensions	Width (mm)	100			
	Height (mm)	9.5			
	Depth (mm)	70			
	Weight (g)	101(Max)			

Parameter		Standard value			
		HITACHI HTS542512k9SA00	**HITACHI HTS542516k9SA00**	**HITACHI HTS542520k9SA00**	**HITACHI HTS542525k9SA00**
Outline dimensions	Width (mm)	69.85 +/- 0.25			
	Height (mm)	9.5			
	Depth (mm)	100.2 +/- 0.25			
	Weight (g)	95 (max.)	95 (max.)	102 (max.)	102 (max.)

Table 1-2 2.5-inch HDD dimensions

Parameter		Standard value		
		FUJITSU MHX2250BT	**FUJITSU MHX2300BT**	**FUJITSU MHZ2400BT**
Outline dimensions	Width (mm)	100		
	Height (mm)	12.5		
	Depth (mm)	70.0		
	Weight (g)	101(Max)		

Table 1-3 2.5-inch HDD specifications

Parameter	Specification				
	TOSHIBA MK1246GSX	**TOSHIBA MK1646GSX**	**TOSHIBA MK2046GSX**	**TOSHIBA MK2546GSX**	**TOSHIBA MK3252GSX**
Storage size (formatted)	120GB	160GB	200GB	250 GB	320GB
Speed (RPM)	5,400				
Data transfer Rate - To/From Media - T0/From Host	730Mbits Media 300MBytes Host				794Mbits Media 3GBytes Host
bus transfer rate (MB/s)	1.5Gbps(150MB/s)				
Average random seek time (read) (ms)	12				
Power-on-to-ready (sec)	3.5(typ)/9.5(Max)				

Parameter	Specification			
	FUJITSU MHY2120BH	**FUJITSU MHY2160BH**	**FUJITSU MHY2200BH**	**FUJITSU MHY2250BH**
Storage size (formatted)	80GB	120GB	200GB	250GB
Speed (RPM)	5,400			
Data transfer Rate - To/From Media - T0/From Host	84.6MB/s Max. 1.5Gbps (150MB/s)			
bus transfer rate (MB/s)	1.5Gbps(150MB/s)			
Average random seek time (read) (ms)	12.0ms/14.0ms			
Power-on-to-ready (sec)	4.0 (typ.)			

Specification				
Parameter	**HITACHI HTS542512k9SA00**	**HITACHI HTS542516k9SA00**	**HITACHI HTS542520k9SA00**	**HITACHI HTS542525k9SA00**
Storage size (formatted)	120GB	160GB	200GB	250GB
Speed (RPM)	5,400			
Data transfer Rate - To/From Media - T0/From Host	65.5MB/s 1.5Gbps	65.5MB/s 1.5Gbps	65.5MB/s 1.5Gbps	65.5MB/s 1.5Gbps
bus transfer rate (MB/s)	150 (MB/s			
Average random seek time (read) (ms)	11			
Power-on-to-ready (sec)	3.5 sec			

Specification			
Parameter	**FUJITSU MHX2250BT**	**FUJITSU MHX2300BT**	**FUJITSU MHZ2400BT**
Storage size (formatted)	250GB	300GB	400GB
Speed (RPM)	4,200		
Data transfer Rate - To/From Media - T0/From Host	60.8MB/s Max. 1.5Gbps (150MB/s)		
bus transfer rate (MB/s)	1.5Gbps (150MB/s)		
Average random seek time (read) (ms)	12.0ms/14.0ms		
Power-on-to-ready (sec)	4.0 (typ)		

1.4 Optical drive (DVD Super Multi Drive)

The DVD Super Multi drive accommodates either 12 cm (4.72-inch) or 8 cm (3.15-inch) CD/DVD-ROM, CD-R/RW, DVD±R/±RW and DVD-RAM. It is a high-performance drive that reads DVD-ROM at maximum 8-speed and CD at maximum 24-speed. Write speed of DVD±R/±RW and DVD-RAM is different depending on the drive.

The DVD Super Multi drive is shown in Figure 1-4. The dimensions and specifications of the DVD Super Multi drive are described in Table 1-4, Table 1-5.

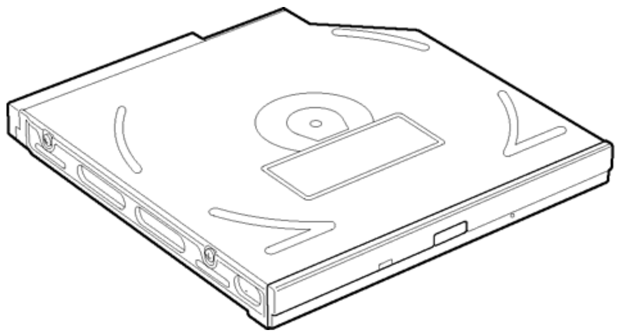


Figure 1-4 DVD Super Multi drive

Table 1-4 DVD Super Multi drive outline dimensions

Parameter		Standard Value			
Outline dimension	Maker	TST TS-L632H	TST TS-L632P	PNR DVR-KD08TBT	PNR DVR-KD08TBL
	Width (mm)	**122.4**	**122.4**	**128**	**128**
	Height (mm)	**12.7**	**12.7**	**12.7**	**12.7**
	Depth (mm)	**126**	**126**	**134**	**134**
	Mass (g)	**104**	**104**	**176.2**	**176.2**

Table 1-5 DVD Super Multi drive specifications (1/4)

Parameter		Drive Specification			
		TST **TS-L632H**	**TST** **TS-L632P**	**PNR** **DVR-KD08TBT**	**PNR** **DVR-KD08TBL**
Data transfer speed	Read (KB/s)	CD-ROM 3600 KB/s CD-R 3600 KB/s CD-RW 3600 KB/s DVD-ROM(L) 10800 KB/s DVD+/-R Dual8100KB/s DVD-RAM 6750 KB/s	CD-ROM 3600 KB/s CD-R 3600 KB/s CD-RW 3600 KB/s DVD-ROM(SL) 10800 KB/s DVD+/-R Dual 8100 KB/s DVD-RAM 6750 KB/s	CDInner 1,545 Outer 3,600 (10.3-24XCAV mode over16 Block Transfer)DVD(single Layer)Inner 4,455 Outer 10,800 (3.3X-8X CAV mode Over16 Block Transfer)DVD-RM Inner 4,155 Outer 6,925 (3X-5XZone-CLV mode Over16 Block Transfer)	CDInner 1,545 Outer 3,600 (10.3-24X CAV mode over16 Block Transfer) DVD(single Layer)Inner 4,455 Outer 10,800 (3.3X-8X CAV mode Over16 Block Transfer)DVD-RAM Inner 4,155 Outer 6,925 (3X-5XZone-CLV mode Over16 Block Transfer)
	Write	CD-R 3600 KB/s MS CD-RW 600 KB/s HS CD-RW 1500 KB/s US CD-RW 2400 KB/s US+ CD-RW Not Support DVD+R/-R 10800 KB/s	CD-R 3600 KB/s MS CD-RW 600 KB/s HS CD-RW 1500 KB/s US CD-RW 2400 KB/s US+ CD-RW Not Support DVD+R/-R 10800 KB/s	CDInner 1,500 Outer 3,600 (24x Zone-CLV CD-R write)DVD-RInner 2,700Outer 10,800 (8X Zone-CLV write)DVD+R Inner 3,240Outer 10,800(8X Zone-CLV write)DVD-RAM Inner 4,155Outer 6,925 (3X-5X Zone-CLV write)	CDInner 1,500 Outer 3,600 (24x Zone-CLV CD-R write) DVD-R Inner 2,700 Outer 10,800 (8X Zone-CLV write) DVD+R Inner 3,240 Outer 10,800 (8X Zone-CLV write) DVD-RAM Inner 4,155 Outer 6,925 (3X-5X Zone-CLV write)
	ATAPI interface (MB/s)	MAX 33.2MB/s	MAX 33.2MB/s	16.6(PIO Mode4/MultiwordDMA Mode2) 33.3(UltraDMAMode2	16.6(PIO Mode4/MultiwordDMA Mode2) 33.3(UltraDMA Mode2)
Access time (ms) (Random)	CD-ROM	130 ms	130 ms	Ave.140(CD-ROM Mode1Disc is used)	Ave.140(CD-ROM Mode 1 Disc is used)
	DVD-ROM	130 ms	130 ms	Ave.150 (DVD-ROM Single Layer Disc is used)	Ave.150 (DVD-ROM Single Layer Disc is use

Buffer memory		2 M	2 M	2 Mbytes	2 Mbytes
Supported disk format	CD	650MB CD-ROMR(Rad Only) 80mm CD(Horizontal Mount only) 800/700/650 CD-Recordable (Read & Write) 700/650 MB CD-Rewritable (Read & Write) 700/650MB High Speed CD-Rewritable (Read & Write) 700/650 MB Ultra Speed CD-Rewritable (Read & Write) Ultra+ Speed CD-Rewritable (Read Only)	650MB CD-ROMR(Read Only) 80mm CD(Horizontal Mount only) 800/700/650 CD-Recordable (Read & Write) 700/650 MB CD-Rewritable (Read & Write) 700/650MB High Speed CD-Rewritable (Read & Write) 700/650 MB Ultra Speed CD-Rewritable (Read & Write) Ultra+ Speed CD-Rewritable (Read Only)	CD-ROM Mode1 CD-ROM XA Mode2 (form1, form2) Photo CD (single and multiple session) Video CD CD-DA CD-Extra Mixed-CD CD-Text CD-R CD-RW(Supports AM2) HSCD-RW(Supports AM2) USCD-RW(Supports AM2) US+CD-RW(Supports AM2)(*Read only)	CD-ROM Mode1 CD-ROM XA Mode2 (form1, form2) Photo CD (single and multiple session) Video CD CD-DA CD-Extra Mixed-CD CD-Text CD-R CD-RW(Supports AM2) HSCD-RW(Supports AM2) USCD-RW(Supports AM2) US+CD-RW(Supports AM2)(*Read only)
	DVD	5/9/10/18 G DVD-Single/Dual (PTP, OTP) (Read Only) 4.7G DVD+-R/RW (Read & Write) DVD+-R Dual (Read & Write) DVD-RAM (Read &Write)80mm DVD	5/9/10/18 G DVD-Single/Dual (PTP, OTP) (Read Only) 4.7G DVD+-R/RW (Read & Write) DVD+-R Dual (Read & Write) DVD-RAM (Read & Write) 80mm DVD	DVD (DVD-5; Single layer, Single side 4.7Gbytes) DVD (DVD-9; Dual layer, Single	DVD (DVD-5; Single layer, Single side 4.7Gbytes) DVD (DVD-9; Dual layer, Single

1.5 Keyboard

The Satellite P300 keyboard has two different kinds of placement, one is for JP style and the other is for US/UK style

Figure 1-5 is a view of the keyboard for US style



Figure 1-5 Keyboard for US style

Figure 1-6 is a view of the keyboard for UK style.

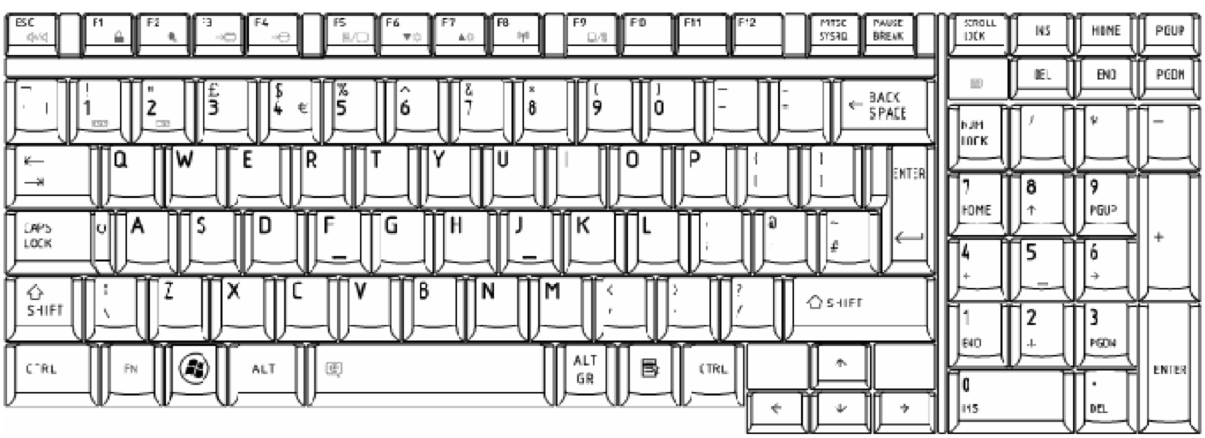


Figure 1-6 Keyboard for UK style

Figure 1-7 is a view of the keyboard for JP style.



Figure 1-7 Keyboard for JP style

See Appendix E for details of the keyboard layout.

1.6 TFT Color Display

The SatelliteP300 and Satellite Pro 300 Panel use CCFL to control backlight.

1.6.1 LCD Module with CCFL Backlight

Figure 1-8 ~ 1-11 shows a view of the LCD module and Table 1-8 lists the specifications.

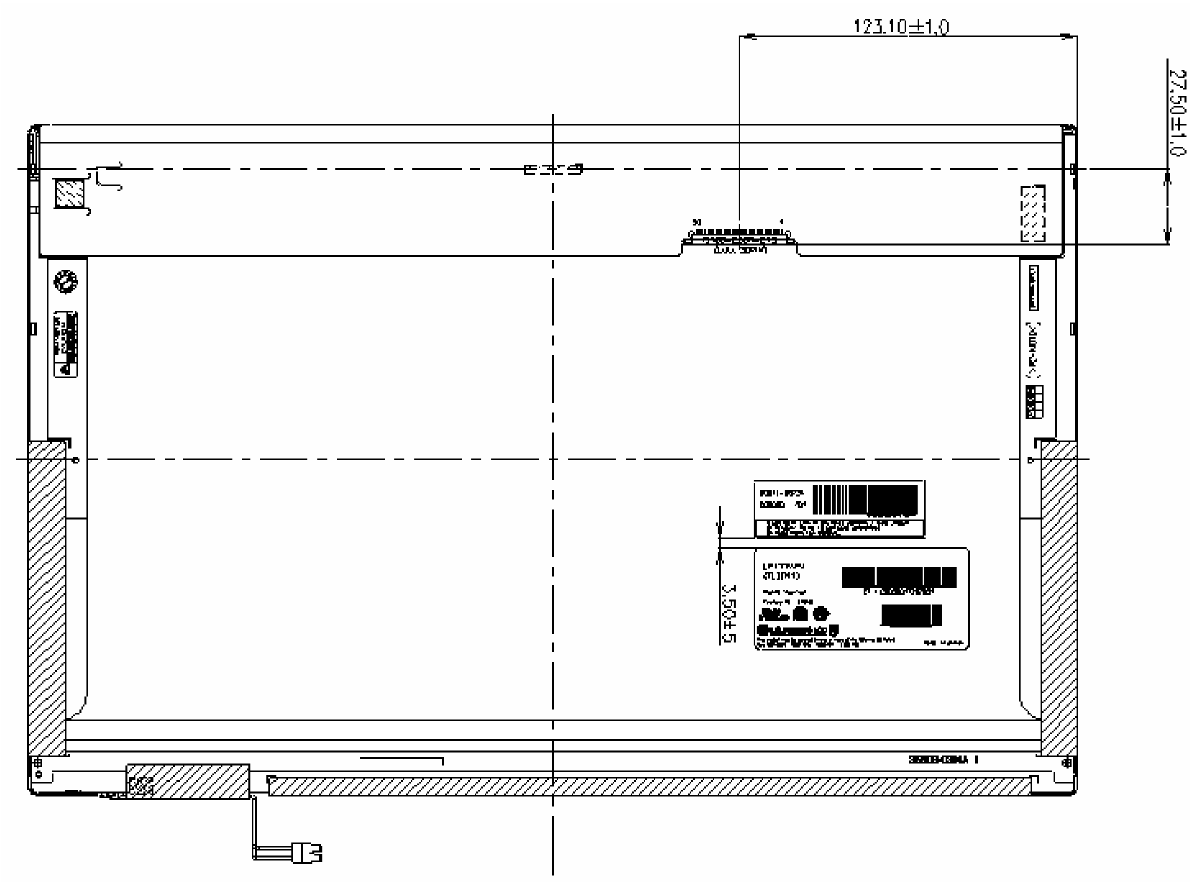


Figure 1-8 LG-Philips LCD Module

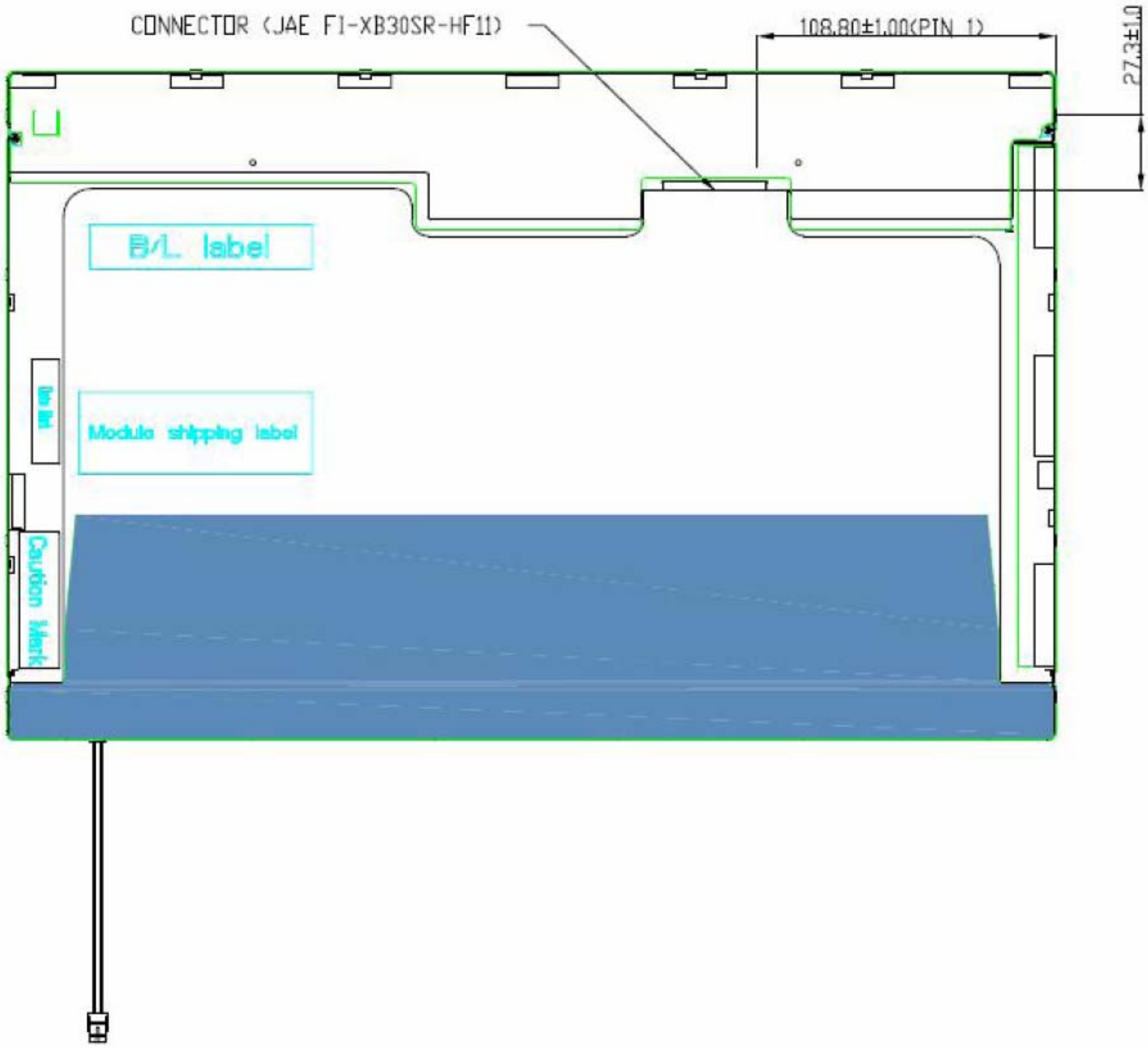


Figure 1-9 AUO LCD Module

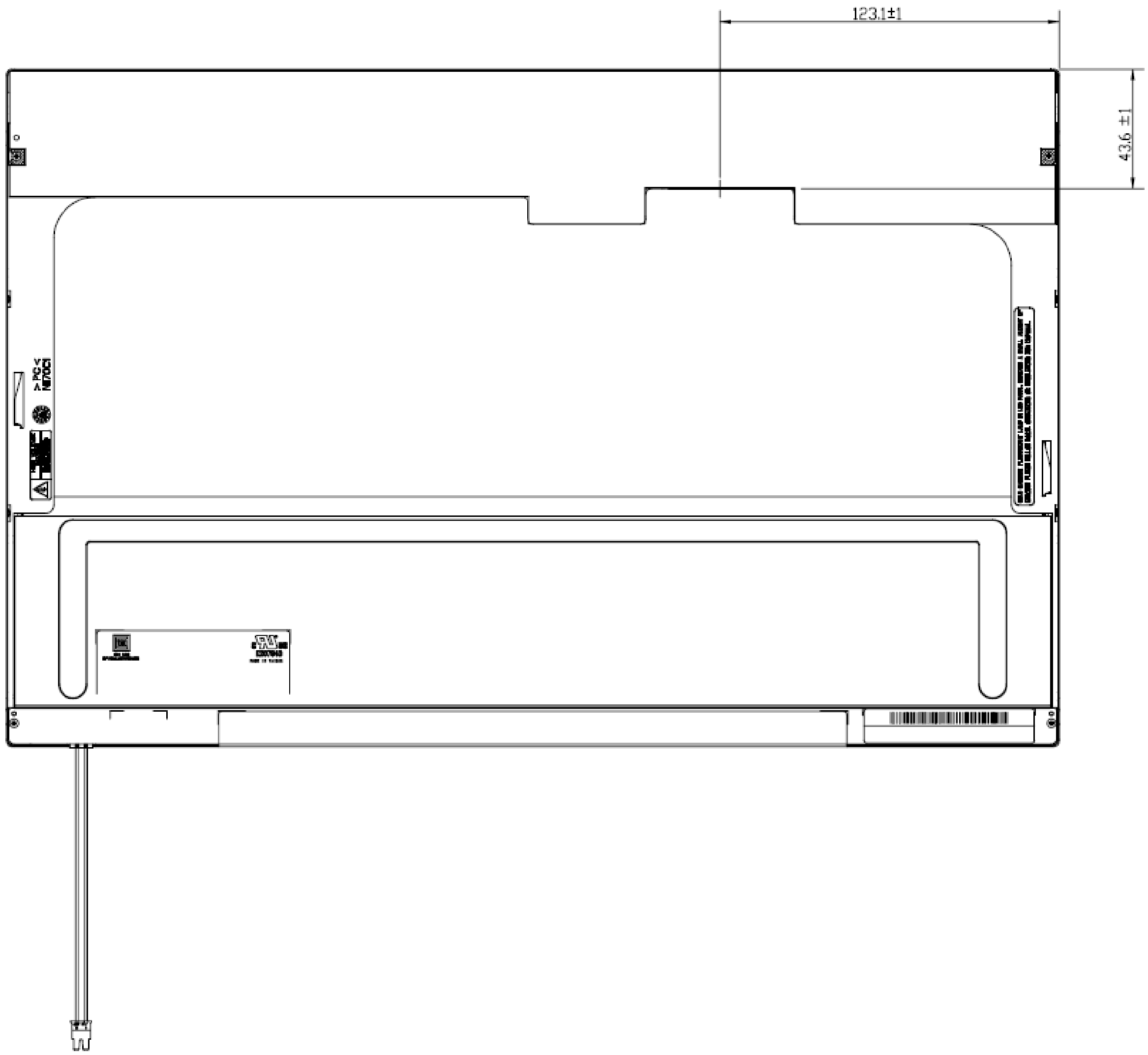


Figure 1-10 CMO LCD Module

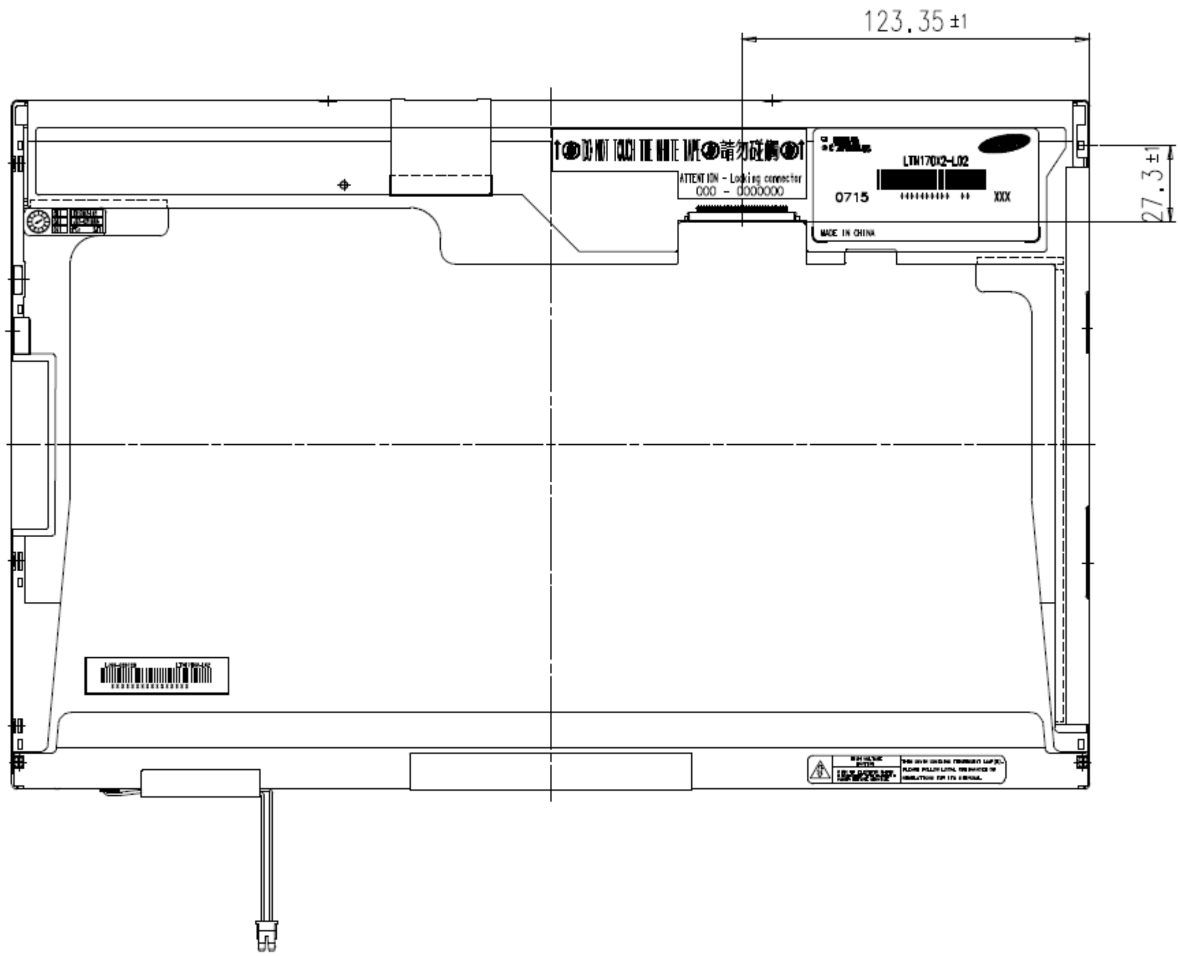


Figure 1-11 SAMSUNG LCD Module

Table 1-6 LCD module specifications

Item	Specifications(WXGA+)			
	LG-Philips **LP171WP4-TLN1**	**AUO** **B170PW06**	**CMO** **N170C2-L02**	**Samsung** **LTN170X2-L02-S**
Number of Dots	1,440 x 3(R,G,B) x 900			
Dot spacing (mm)	0.255(H)× 0.2555(V)			
Display Colors	262,144 colors			

1.6.2 CCFL Inverter Board

Table 1-7 lists the FL inverter board specifications.

Table 1-7 FL inverter board specifications

Item		Specifications			
		Foxconn T18I095.00	**Delta DAC-08N035 AF**	**SUMIDA TWS-449-308**	**TDK TBD485NR**
Input	Voltage (V)	8~20	8~20	8~20	8~20
	Power (W)	7.5W	7.5W	7.5W	7.5W
Output	Voltage (Vrms)	612~945	612~945	612~945	612~945
	Current (f=55KHz)(mArms)	2.3±0.4 ~ 6.5±0.3			

1.7 Power Rails

Table 1-8 lists the power rail output specifications of Santa Rosa platform.

Table 1-8 Power supply output rating

Name	Power supply （Yes/No）			
	Voltage [V]	Power OFF Suspend mode	Power OFF Boot mode	No Battery
+5VPCU	5	**Yes**	**Yes**	No
+5V_S5	5	**Yes**	No	No
+5V	5	No	No	No
+5VSATA	5	No	No	No
USBPWR1	5	No	No	No
+5V_TP	5	No	No	No
VCCRTC	3.3	**Yes**	**Yes**	**Yes**
TH_FAN_POWER	3.1~5	No	No	No
+3VPCU	3.3	**Yes**	**Yes**	No
+3V_S5	3.3	**Yes**	No	No
+3VSUS	3.3	**Yes**	No	No
+3V	3.3	No	No	No
CCD_POWER	3.3	No	No	No
VCC_XD	3.3	No	No	No
+1.8VSUS	1.8	**Yes**	No	No
+1.5V	1.5	No	No	No
+1.25V	1.25	No	No	No
+1.05V	1.05	No	No	No
VCC_CORE	0.55~1.575	No	No	No

1.8 Batteries

The PC has the following two batteries.

- θ Main battery
- θ Real time clock (RTC) battery

Table 1-9 lists the specifications for these two batteries.

Table 1-9 Battery specifications

Battery Name		Battery Element	Output Voltage	Capacity
Main battery	Sanyo 6 cell	Lithium ion	10.8v	4000mAh
	Panasonic 6 cell		10.8v	4000mAh
	Sanyo 9 cell		10.8v	6000mAh
Real time clock (RTC) battery	Panasonic ML1220/F1BE-MOLEX-58ZL1	Lithium ion	3V	17mAh

1.8.1 Main Battery

The main battery is the primary power supply for the computer when the AC adapter is not connected. In Standby, the main battery maintains the current status of the computer.

1.8.2 Battery Charging Control

Battery charging is controlled by a power supply microprocessor. The power supply microprocessor controls power supply and detects a full charge when the AC adaptor and battery are connected to the computer.

- θ Battery Charge

When the AC adapter is connected, normal charging is used while the system is turned on and quick charge is used while the system is turned off. Refer to the following Table 1-10.

Table 1-10 Time required for charges of main battery

Condition	Charging Time
Power On Charge	About 12 hours-
Power Off Charge	About 4 hours

Charge is stopped in the following cases.

1. The main battery is fully charged
2. The main battery is removed
3. Main battery or AC adapter voltage is abnormal
4. Charging current is abnormal

- θ Data preservation time

When turning off the power in being charged fully, the preservation time is as following Table 1-11.

Table 1-11 Data preservation time

<table>
<tr><th colspan="2">Condition</th><th>preservation time</th></tr>
<tr><td colspan="2">Standby</td><td>About 3 days</td></tr>
<tr><td colspan="2">Hibernation</td><td>About 1 month</td></tr>
<tr><td rowspan="3">Battery Pack</td><td>3 cell</td><td>Approximately 1.5 days(sleep mode)</td></tr>
<tr><td>6 cell</td><td>Approximately 3 days(sleep mode)</td></tr>
<tr><td>9 cell</td><td>Approximately 5 days(sleep mode)</td></tr>
<tr><td colspan="3">Approximately 1 month(shutdown mode,All type of battery pack</td></tr>
</table>

1.8.3 RTC Battery

The RTC battery provides the power supply to maintain the date, time, and other system information in memory.

Table 1-12 lists the Time required for charges of RTC battery and data preservation time.

Table 1-12 Time required for charges of RTC battery

Condition	Time
Power ON (Lights Power LED)	About 24 hours
Data preservation tome (Full-charged)	About a month

1.9 AC Adapter

The AC adapter is used to charge the battery.

Table 1-13 lists the AC adapter specifications.

Table 1-13 AC adapter specifications

Parameter	**Specification**		
With Led	**DELTA/ LITE-ON**	**DELTA/ LITE-ON**	**DELTA/ LITE-ON**
Power	75W	90W	120W
Input voltage	AC 100V/240V		
Input frequency	50Hz/60Hz		
Input current	≦1.5A		
Output voltage	DC 19V		
Output current	3.95A	4.74A	6.3A

Chapter 2

Troubleshooting Procedures

Chapter 2 Contents

2.1 Troubleshooting

Chapter 2 describes how to determine which Field Replaceable Unit (FRU) in the computer is causing the computer to malfunction.

The FRUs covered are:

1. Power supply
2. System Board
3. USB FDD
4. 2.5” HDD
5. Keyboard
6. Touch pad
7. Display
8. Optical Disk Drive
9. Modem
10. LAN
11. Wireless LAN
12. Sound
13, Finger Print Board
14, Bluetooth

The Test Program operations are described in Chapter 3. Detailed replacement procedures are described in Chapter 4.

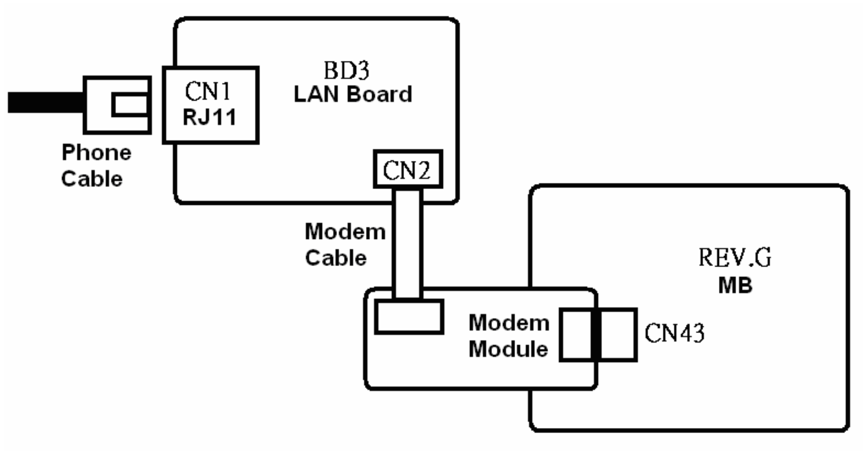
> ***NOTE:*** *After replacing the system board or CPU, it is necessary to execute the subtest 01 initial configuration of the 3.3 Setting of the hardware configuration in Chapter 3. Also update with the latest BIOS as described in Appendix G “BIOS Rewrite Procedures”*
>
> *After replacing the LCD, update with the latest EC/KBC as described in Appendix H “EC/KBC Rewrite Procedures” to set the SVP parameter.*

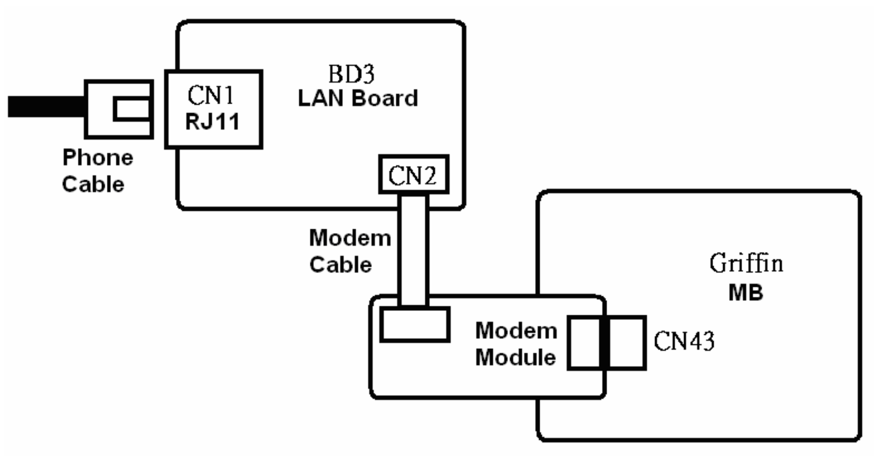
The implement for the Diagnostics procedures is referred to Chapter 3. Also, following implements are necessary:

1. Phillips screwdrivers (For replacement procedures)
2. Implements for debugging port check
   - Toshiba MS-DOS system FD
   - RS-232C cross cable
   - Test board with debug port test cable
   - PC for displaying debug port test result

There are following two types of connections in the figure of board and module connection in and after 2.3 Power Supply Troubleshooting.

(1) Cable connection is described in the figure as line.
(2) Pin connection is described in the figure as arrow.
<e.g.> Connection of modem





2.2 Troubleshooting Flowchart

Use the flowchart in Figure 2-1 as a guide for determining which troubleshooting procedures to execute. Before going through the flowchart steps, verify the following:

- ❑ Ask him or her to enter the password if a password is registered.
- ❑ Verify with the customer that Toshiba Windows is installed on the hard disk. Non-Windows operating systems can cause the computer to malfunction.
- ❑ Make sure all optional equipment is removed from the computer.

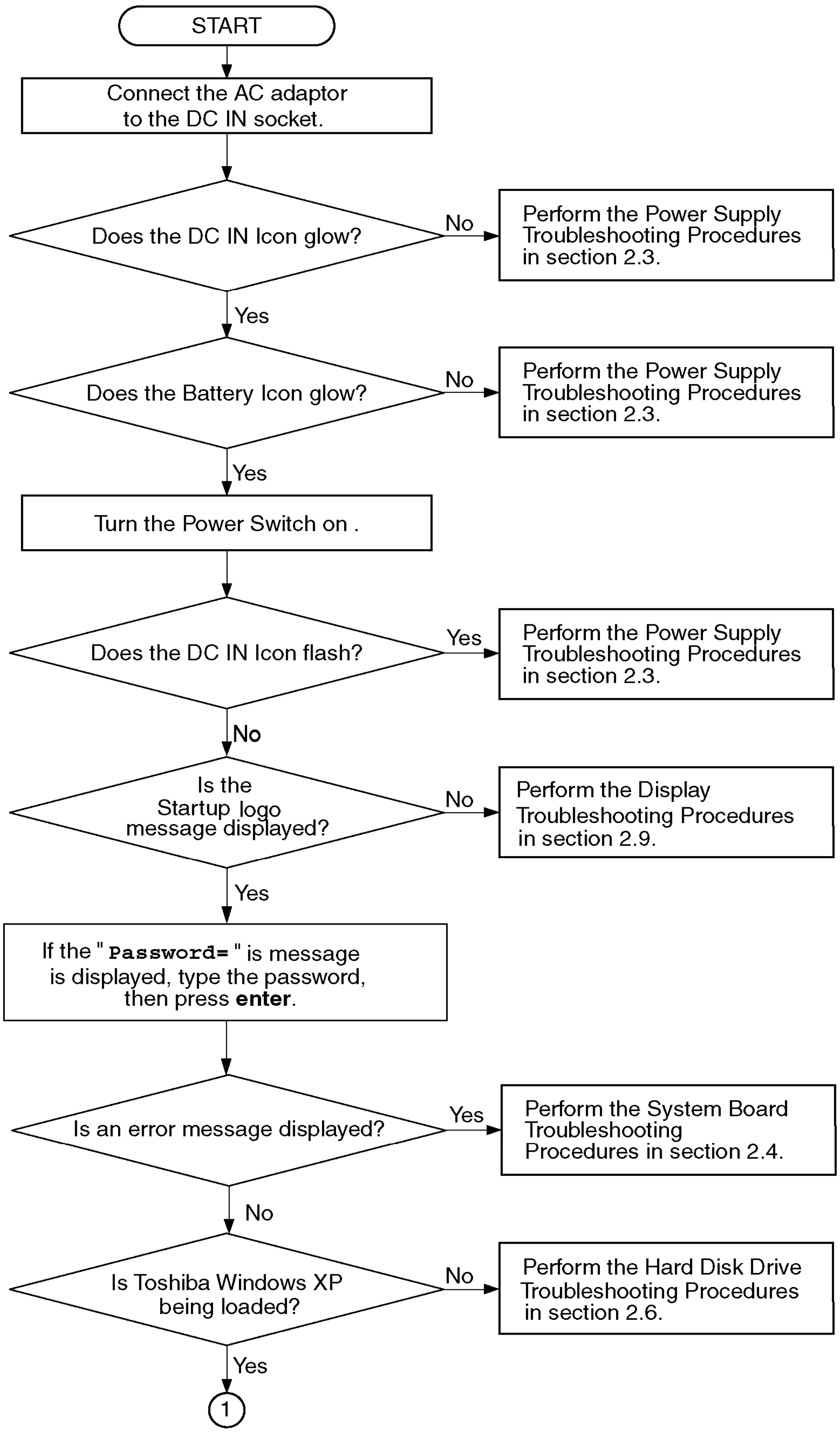


Figure 2-1 Troubleshooting flowchart (1/2)

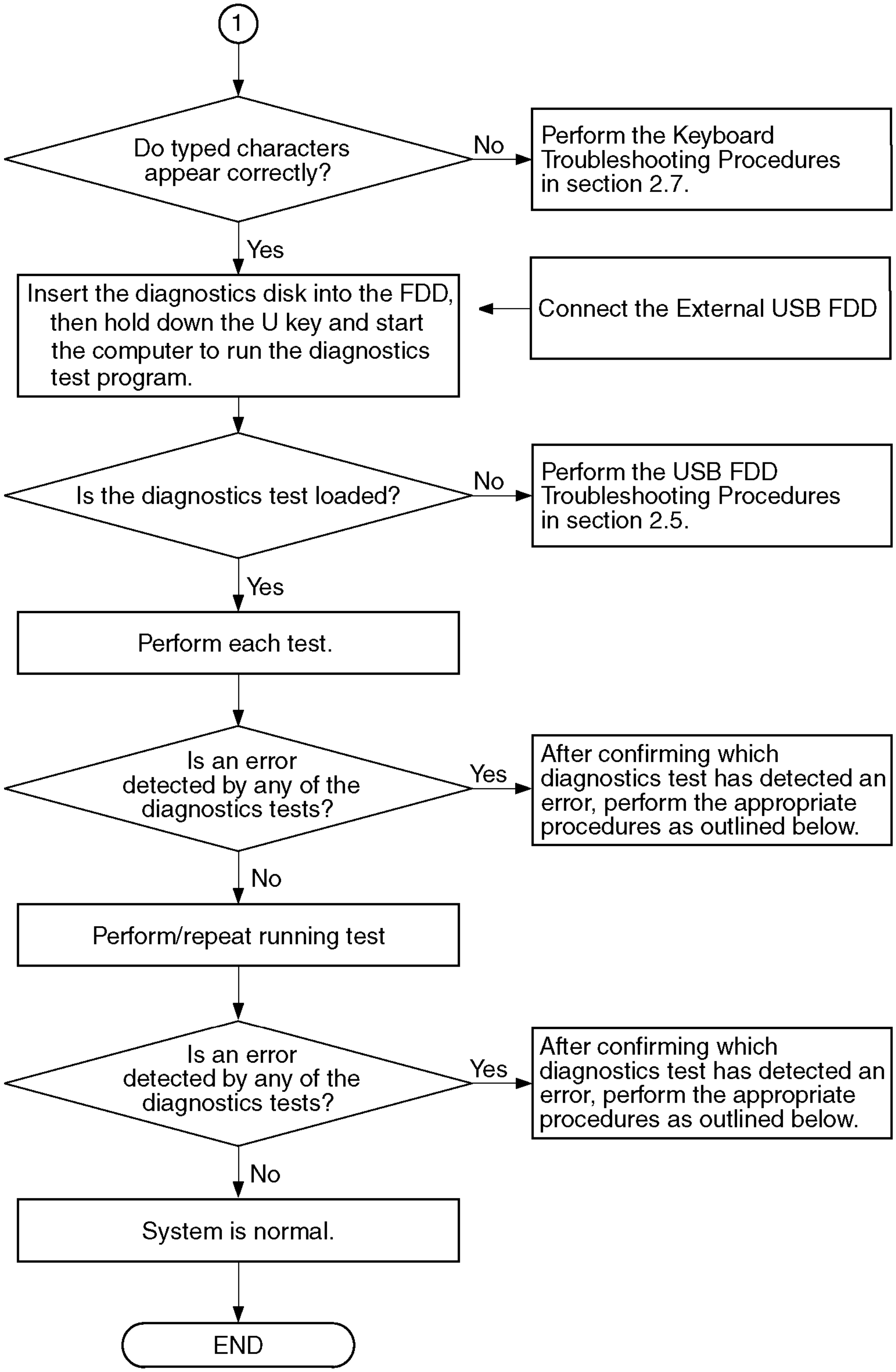


Figure 2-1 Troubleshooting flowchart (2/2)

If the diagnostics program cannot detect an error, the problem may be intermittent. The Test program should be executed several times to isolate the problem. Check the Log Utilities function to confirm which diagnostic test detected an error(s), and then perform the appropriate troubleshooting procedures as follows:

1. If an error is detected on the system test, memory test, display test, CD-ROM/DVD-ROM test, expansion test, real timer test, sound test or Modem/LAN/Bluetooth /IEEE1394 test, perform the System Board Troubleshooting Procedures in Section 2.4.
2. If an error is detected on the floppy disk test, perform the USB FDD Troubleshooting Procedures in Section 2.5.
3. If an error is detected on the hard disk test, perform the HDD Troubleshooting Procedures in Section 2.6.
4. If an error is found on the keyboard test (DIAGNOSTICS TEST) and pressed key display test (ONLY ONE TEST), perform the Keyboard Troubleshooting Procedures in Section 2.7.
5. If an error is found on the touch pad test (ONLY ONE TEST), perform the touch pad Troubleshooting Procedures in Section 2.8.
6. If an error is detected on the display test, perform the Display Troubleshooting Procedures in Section 2.9.
7. If an error is detected on the CD-ROM/DVD-ROM test, perform the Optical Disk Drive Troubleshooting Procedures in Section 2.10.
8. If an error is detected on the modem test, perform the Modem Troubleshooting Procedures in Section 2.11.
9. If an error is detected on the LAN test, perform the LAN Troubleshooting Procedures in Section 2.12.
10. If an error is detected on the wireless LAN test, perform the Wireless LAN Troubleshooting Procedures in Section 2.13.
11. If an error is detected on the sound test, perform the Sound Troubleshooting Procedures in Section 2.14.
12. If an error is detected on the VGA daughter card test, perform the VGA Troubleshooting Procedures in Section 2.15.
13. If an error is detected on the fingerprint test, perform the fingerprint Troubleshooting Procedures in Section 2.16.
14. If an error is detected on the Bluetooth test, perform the Bluetooth Troubleshooting

Procedures in Section 2.17.

2.3 Power Supply Troubleshooting

The power supply controller controls many functions and components. To determine if the power supply is functioning properly, start with Procedure 1 and continue with the other Procedures as instructed. The procedures described in this section are:

Procedure 1: Power Status Check

Procedure 2: Error Code Check

Procedure 3: Connection Check

Procedure 4: Charging Check

Procedure 5: Replacement Check

Procedure 1 Power Status Check

The following LED indicates the power supply status:

- Battery LED
- DC IN LED

The Power Supply control displays the power supply status with the Battery LED and the DC IN LED as listed in the tables below.

Table 2-1 Battery icon(Low cost)

Battery icon	Power supply status
Lights orange	Battery is charged and the external DC is input. It has no relation with ON/OFF of the system power.
Lights white(Green)	Battery is fully charged and the external DC is input. It has no relation with ON/OFF of the system power.
Blinks orange (even intervals)	The battery level is low while the system power is ON.
Blinks orange once (at being switched on)	The system is driven by only a battery and the battery level is low.
Doesn’t light	Any condition other than those above.

Table 2-2 DC IN icon(Low cost)

DC IN icon	Power supply status
Lights white(Green)	DC power is being supplied from the AC adapter.
Blinks white(Green)	Power supply malfunction[*1]
Doesn't light	Any condition other than those above.

*1 When the power supply controller detects a malfunction, the DC IN icon blinks white. It shows an error code.

When the icon is blinking, perform the following procedure.

1. Remove the battery pack and the AC adapter.
2. Re-attach the battery pack and the AC adapter.

If the icon is still blinking after the operation above, check the followings:

Check 1 If the DC IN icon blinks white, go to Procedure 2.

Check 2 If the DC IN icon does not light, go to Procedure 3.

Check 3 If the battery icon does not light white or red, go to Procedure 4.

***NOTE**: Use a supplied AC adapter.*

Procedure 2. Error Code Check

The following table lists the error codes and error status names for the Diagnostic Tests.

Table 2-3 Error codes and error status names (1/2)

Device Name	Error Code	Error Status Name
(Common)	FF	Data Compare Error
Memory	02	Protected Mode Not Changed
	??	Other Error
FDD	01	Bad Command Error
	02	Address Mark Not Found
	03	Write Protected
	04	Record Not Found
	06	Media Change Line Error
	08	DMA Overrun Error
	09	DMA Boundary Error
	0C	Select Media Error
	10	CRC Error
	20	FDC Error
	40	Seek Error
	80	Time Out Error
	??	Other Error
HDD	01	Bad Command Error
	02	Bad Address Mark Error
	04	Record Not Found
	05	HDC Not Reset Error
	07	Drive Not Initialized
	09	DMA Boundary Error
	0A	Bad Sector
	0B	Bad Track Error
	10	ECC Error
	11	ECC Recover Enabled
	20	HDC Error
	40	Seek Error
	80	Time Out Error
	AA	Drive Not Ready

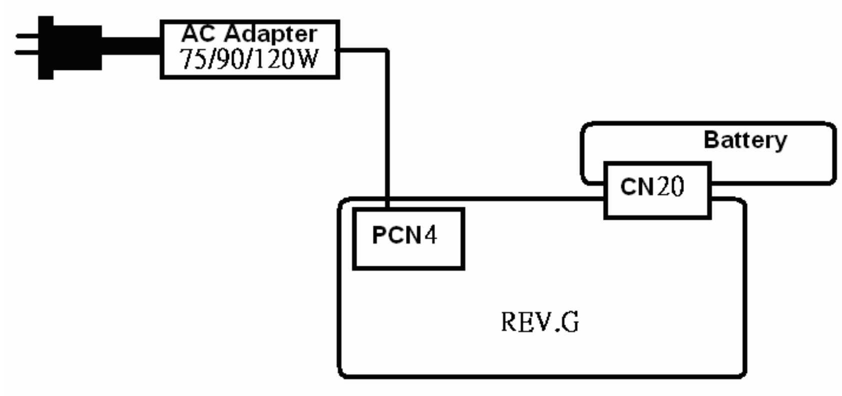
Table2 -3 Error codes and error status names (2/2)

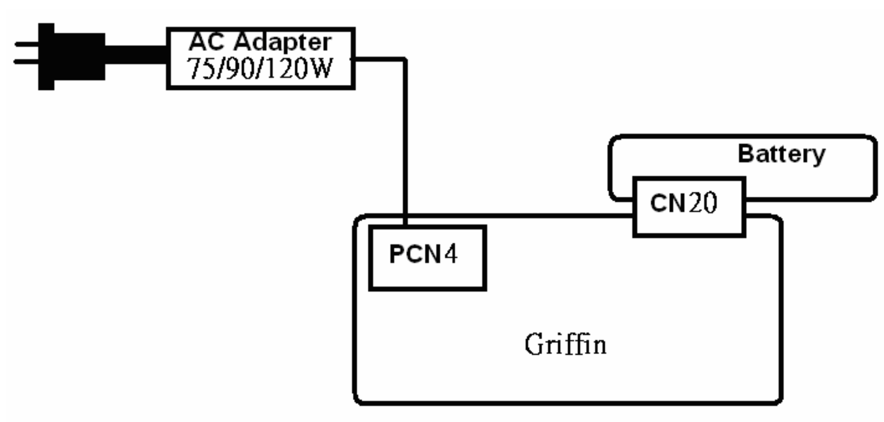
Device Name	Error Code	Error Status Name
HDD	BB	Undefined Error
	CC	Write Fault
	E0	Status Error
	F0	No Sense Error
	??	Other Error
Cache Memory	02	Protect Mode Error
	03	Caching Error
	??	Other Error
Multimedia	01	Write Error
	0F	Invalid Drive
	15	Drive Not Ready
	??	Other Error

NOTE: *If error status name is* **Other Error** *, please reference the* **Error Code** *for error information*

Procedure 3 Connection Check

The wiring diagram related to the power supply is shown below:





Any of the connectors may be disconnected. Perform Check 1.

Check 1 Make sure the AC adapter and the AC power cord is firmly plugged into the DC IN connector PCN4 (REV.G and Griffin) and wall outlet. If these cables are connected firmly, go to Check 2.

Check 2 Replace the AC adapter and the AC power cord with new ones.

- If the DC IN icon does not light, go to Procedure 5.
- If the battery icon does not light, go to Check 3.

Check 3 Make sure the battery pack is installed in the computer correctly. If the battery is properly installed and the battery icon still does not light, go to Procedure 4.

Procedure 4 Charging Check

Check if the power supply controller charges the battery pack properly. Perform the

following procedures:

Check 1 Make sure the AC adapter is firmly plugged into the DC IN socket.

Check 2 Make sure the battery pack is properly installed. If it is properly installed, go to Check 3.

Check 3 The battery pack may be completely discharged. Wait a few minutes to charge the battery pack while connecting the battery pack and the AC adapter. If the battery pack is still not charged, go to Check 4.

Check 4 The battery's temperature is too high or low. Leave the battery for a while to adjust it in the right temperature. If the battery pack is still not charged, go to Check 5.

Check 5 Replace the battery pack with a new one. If the battery pack is still not charged, go to Procedure 5.

Procedure 5 Replacement Check

The power is supplied to the system board by the AC adapter. If either the AC adapter or the system board was damaged, perform the following Checks.

To disassemble the computer, follow the steps described in Chapter 4, *Replacement Procedures*.

When AC adapter is connected;

Check 1 AC adapter may be faulty. Replace the AC adapter with a new one. If the problem still occurs, perform Check 2.

Check 2 System board may be faulty. Replace the system board with a new one.

When AC adapter is not connected ;
(When driving with battery pack)

Check 1 Battery pack may be faulty. Replace it with a new one. If the problem still occurs, perform Check 2.

Check 2 System board may be faulty. Replace it with a new one.

2.4 System Board Troubleshooting

This section describes how to determine if the system board is malfunctioning or not. Start with Procedure 1 and continue with the other procedures as instructed. The procedures described in this section are:

Procedure 1: Message Check

Procedure 2: Debugging Port Check

Procedure 3: Diagnostic Test Program Execution Check

Procedure 4: Replacement Check

Procedure 1 Message Check

When the power is turned on, the system performs the Power On Self Test (POST) installed in the BIOS ROM. The POST tests each IC on the system board and initializes it.

- ❑ If an error message is shown on the display, perform Check 1.
- ❑ If there is no error message, go to Procedure 2.
- ❑ If MS-DOS or Windows XP is properly loaded, go to Procedure 4.

Check 1 If one of the following error messages is displayed on the screen, press the **F1** key as the message instructs. These errors occur when the system configuration preserved in the RTC memory (CMOS type memory) is not the same as the actual configuration or when the data is lost.

If you press the **F1** key as the message instructs, the SETUP screen appears to set the system configuration. If error message (b) appears often when the power is turned on, replace the RTC battery. If any other error message is displayed, perform Check 2.

```
(a)     *** Bad HDD type ***
        Check system.  Then press [F1] key ......
(b)     *** Bad RTC battery ***
        Check system.  Then press [F1] key ......
(c)     *** Bad configuration ***
        Check system.  Then press [F1] key ......
(d)     *** Bad memory size ***
        Check system.  Then press [F1] key ......
(e)     *** Bad time function ***
        Check system.  Then press [F1] key ......
(f)     *** Bad check sum (CMOS) ***
        Check system.  Then press [F1] key ......
(g)     *** Bad check sum (ROM) ***
        Check system.  Then press [F1] key ......
```

Check 2 If the following error message is displayed on the screen, press any key as the message instructs.
The following error message appears when data stored in RAM under the resume function is lost because the battery has become discharged or the system board is damaged. Go to Procedure 3.

```
WARNING: RESUME FAILURE.
PRESS ANY KEY TO CONTINUE.
```

If any other error message displays, perform Check 3.

Check 3 The IRT checks the system board. When the IRT detects an error, the system stops or an error message appears.

If one of the following error messages (1) through (17), (24) or (25) is displayed, go to Procedure 4.

If error message (18) is displayed, go to the Keyboard Troubleshooting Procedures.

If error message (19), (20) or (21) is displayed, go to the 2.5” HDD Troubleshooting Procedures.

If error message (22) or (23) is displayed, go to the USB FDD Troubleshooting Procedures.

(1) PIT ERROR
(2) MEMORY REFRESH ERROR
(3) TIMER CH.2 OUT ERROR
(4) CMOS CHECKSUM ERROR
(5) CMOS BAD BATTERY ERROR
(6) FIRST 64KB MEMORY ERROR
(7) FIRST 64KB MEMORY PARITY ERROR
(8) VRAM ERROR
(9) SYSTEM MEMORY ERROR
(10) SYSTEM MEMORY PARITY ERROR
(11) EXTENDED MEMORY ERROR
(12) EXTENDED MEMORY PARITY ERROR
(13) DMA PAGE REGISTER ERROR
(14) DMAC #1 ERROR
(15) DMAC #2 ERROR
(16) PIC #1 ERROR
(17) PIC #2 ERROR
(18) KBC ERROR
(19) HDC ERROR
(20) HDD #0 ERROR
(21) HDD #1 ERROR
(22) NO FDD ERROR
(23) FDC ERROR
(24) TIMER INTERRUPT ERROR
(25) RTC UPDATE ERROR

Procedure 2 Debugging Port Check

Check the MiniPCI Debug board. The tool for debug port test is shown below.

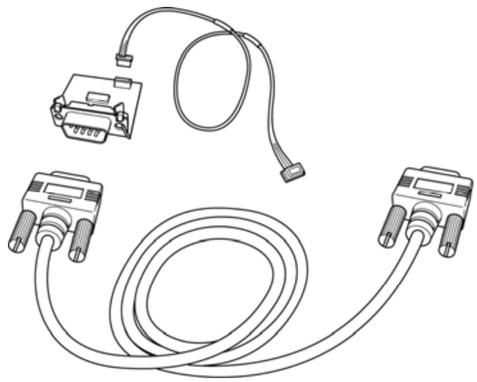


Figure 2-2 A set of tool for debug port test

The test procedures are follows:

1. Replace Mini PCI debug port with Wireless LAN card, check LED in the Mini PCI debug board

The following is a list of the Test Point codes written to port 80h at the start of each routine, the beep codes issued for terminal errors, and a description of the POST routine. Unless otherwise noted, these codes are valid for Phoenix BIOS 4.0 Release 6.0.

NOTE: The following routines are sorted by their test point numbers were assigned in the BIOS code. Their actual order as executed during POST can Be quite different.

Code Beeps POST Routine Description

02h	Verify Real Mode
03h	Disable Non-Maskable Interrupt (NMI)
04h	Get CPU type
06h	Initialize system hardware
08h	Initialize chipset with initial POST values
09h	Set IN POST flag
0Ah	Initialize CPU registers
0Bh	Enable CPU cache
0Ch	Initialize caches to initial POST values
0Eh	Initialize I/O component
0Fh	Initialize the local bus IDE
10h	Initialize Power Management
11h	Load alternate registers with initial POST values
12h	Restore CPU control word during warm boot

13h Initialize PCI Bus Mastering devices

Code	Beeps	POST Routine Description
14h		Initialize keyboard controller
16h	1-2-2-3	BIOS ROM checksum
17h		Initialize cache before memory autosize
18h		8254 timer initialization
1Ah		8237 DMA controller initialization
1Ch		Reset Programmable Interrupt Controller
20h	1-3-1-1	Test DRAM refresh
22h	1-3-1-3	Test 8742 Keyboard Controller
24h		Set ES segment register to 4 GB
26h		Enable A20 line
28h		Autosize DRAM
29h		Initialize POST Memory Manager
2Ah		Clear 512 KB base RAM
2Ch	1-3-4-1	RAM failure on address line ***xxxx****
2Eh	1-3-4-3	RAM failure on data bits ***xxxx**** of low byte of memory bus
2Fh		Enable cache before system BIOS shadow
30h	1-4-1-1	RAM failure on data bits ***xxxx**** of high byte of memory bus
32h		Test CPU bus-clock frequency
33h		Initialize Phoenix Dispatch Manager
36h		Warm start shut down
38h		Shadow system BIOS ROM
3Ah		Autosize cache
3Ch		Advanced configuration of chipset registers
3Dh		Load alternate registers with CMOS values
42h		Initialize interrupt vectors
45h		POST device initialization
46h	2-1-2-3	Check ROM copyright notice
48h		Check video configuration against CMOS
49h		Initialize PCI bus and devices
4Ah		Initialize all video adapters in system
4Bh		QuietBoot start (optional)
4Ch		Shadow video BIOS ROM
4Eh		Display BIOS copyright notice
50h		Display CPU type and speed
51h		Initialize EISA board
52h		Test keyboard
54h		Set key click if enabled
58h	2-2-3-1	Test for unexpected interrupts
59h		Initialize POST display service
5Ah		Display prompt "Press F2 to enter SETUP"
5Bh		Disable CPU cache
5Ch		Test RAM between 512 and 640 KB
60h		Test extended memory

62h	Test extended memory address lines
64h	Jump to UserPatch1
66h	Configure advanced cache registers
67h	Initialize Multi Processor APIC
68h	Enable external and CPU caches
69h	Setup System Management Mode (SMM) area
6Ah	Display external L2 cache size
6Bh	Load custom defaults (optional)
6Ch	Display shadow-area message
6Eh	Display possible high address for UMB recovery
70h	Display error messages
72h	Check for configuration errors
76h	Check for keyboard errors
7Ch	Set up hardware interrupt vectors
7Eh	Initialize coprocessor if present
80h	Disable onboard Super I/O ports and IRQs
81h	Late POST device initialization
82h	Detect and install external RS232 ports
83h	Configure non-MCD IDE controllers
84h	Detect and install external parallel ports
85h	Initialize PC-compatible PnP ISA devices
86h	Re-initialize onboard I/O ports.
87h	Configure Motheboard Configurable Devices (optional)
88h	Initialize BIOS Data Area
89h	Enable Non-Maskable Interrupts (NMIs)
8Ah	Initialize Extended BIOS Data Area
8Bh	Test and initialize PS/2 mouse
8Ch	Initialize floppy controller (optional)
8Fh	Determine number of ATA drives (optional)
90h	Initialize hard-disk controllers
91h	Initialize local-bus hard-disk controllers
92h	Jump to UserPatch2
93h	Build MPTABLE for multi-processor boards
95h	Install CD ROM for boot
96h	Clear huge ES segment register
97h	Fixup Multi Processor table
98h 1-2	Search for option ROMs. One long, two short beeps on checksum failure
99h	Check for SMART Drive (optional)
9Ah	Shadow option ROMs
9Ch	Set up Power Management
9Dh	Initialize security engine (optional)
9Eh	Enable hardware interrupts
9Fh	Determine number of ATA and SCSI drives
A0h	Set time of day

A2h Check key lock
A4h Initialize Typematic rate
A8h Erase F2 prompt

Code Beeps POST Routine Description

AAh Scan for F2 key stroke
ACh Enter SETUP
AEh Clear Boot flag
B0h Check for errors
B2h POST done - prepare to boot operating system
B4h 1 One short beep before boot
B5h Terminate QuietBoot (optional)
B6h Check password (optional)
B9h Prepare Boot
Bah Initialize DMI parameters
BBh Initialize PnP Option ROMs
BCh Clear parity checkers
BDh Display MultiBoot menu
BEh Clear screen (optional)
BFh Check virus and backup reminders
C0h Try to boot with INT 19
C1h Initialize POST Error Manager (PEM)
C2h Initialize error logging
C3h Initialize error display function
C4h Initialize system error handler
C5h PnPnd dual CMOS (optional)
C6h Initialize notebook docking (optional)
C7h Initialize notebook docking late
C8h Force check (optional)
C9h Extended checksum (optional)
D2h Unknown interrupt

Code Beeps For Boot Block in Flash ROM

E0h	Initialize the chipset
E1h	Initialize the bridge
E2h	Initialize the CPU
E3h	Initialize system timer
E4h	Initialize system I/O
E5h	Check force recovery boot
E6h	Checksum BIOS ROM
E7h	Go to BIOS
E8h	Set Huge Segment
E9h	Initialize Multi Processor
EAh	Initialize OEM special code
EBh	Initialize PIC and DMA
ECh	Initialize Memory type
EDh	Initialize Memory size
EEh	Shadow Boot Block
EFh	System memory test
F0h	Initialize interrupt vectors
F1h	Initialize Run Time Clock
F2h	Initialize video
F3h	Initialize System Management Mode
F4h	1 Output one beep before boot
F5h	Boot to Mini DOS
F6h	Clear Huge Segment
F7h	Boot to Full DOS

Procedure 3 Diagnostic Test Program Execution Check

Execute the following tests from the Diagnostic Test Menu. These tests check the system board. Refer to Chapter 3, *Tests and Diagnostic,* for more information on how to perform these tests.

1. System test
2. Memory test
3. Keyboard test
4. Display test
5. Floppy Disk test
6. VGA test
7. VGA Memory test
8. Hard Disk test
9. CPU Temperature test
10. Main Battery test
11. BIOS test
12. CD-ROM/DVD-ROM test
13. System Status LED test
14. Wireless LAN test
15. LAN/Modem/Sound test
16. UUID test-DMI Information (Write DMI)

If an error is detected during these tests, go to Procedure 4.

Procedure 4 Replacement Check

System board may be faulty. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures* and replace system board with a new one.

2.5 USB FDD Troubleshooting

To check if the USB FDD is malfunctioning or not, follow the troubleshooting procedures below as instructed.

Procedure 1: FDD Head Cleaning Check

Procedure 2: Diagnostic Test Program Execution Check

Procedure 3: Connector Check and Replacement Check

Procedure 1 FDD Head Cleaning Check

FDD head cleaning is one option available in the Diagnostic Program.

After connecting USB FDD, insert the Diagnostics Disk in the floppy disk drive. Turn on the computer and run the test. And then clean the FDD heads using the cleaning kit. If the FDD still does not function properly after cleaning, go to Procedure 2.

Detailed operation is given in Chapter 3, *Tests and Diagnostics*.

If the test program cannot be executed on the computer, go to Procedure 3.

Procedure 2   Diagnostic Test Program Execution Check

Insert the Diagnostics Disk in the USB FDD, turn on the computer and run the test. Refer to Chapter 3, *Tests and Diagnostics,* for more information about the diagnostics test procedures.

Make sure the floppy disk is formatted correctly and that the write protect tab is disabled. Floppy disk drive test error codes and their status names are listed in Table 2-7. If any other errors occur while executing the FDD diagnostics test, go to Check 1.

Table 2-7   FDD error code and status

Code	Status
01h	Bad command
02h	Address mark not found
03h	Write protected
04h	Record not found
06h	Media replaced
08h	DMA overrun error
09h	DMA boundary error
10h	CRC error
20h	FDC error
40h	Seek error
60h	FDD not drive
80h	Time out error (Not ready)
EEh	Write buffer error
FFh	Data compare error

Check 1   If the following message is displayed, disable the write protect tab on the floppy disk by sliding the write protect tab to “write enable”. If any other message appears, perform Check 2.

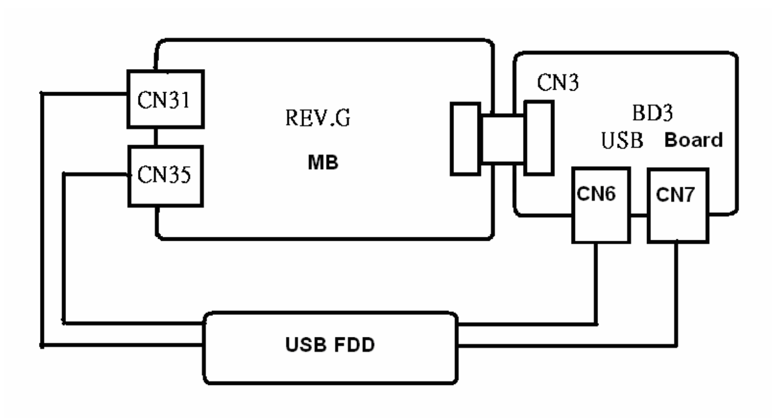
```
Write protected
```

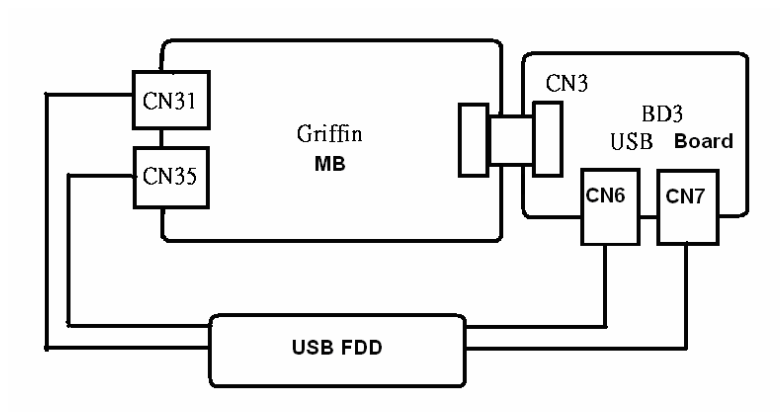
Check 2   Make sure the floppy disk is formatted correctly. If it is, go to Procedure 3.

Procedure 3 Connector Check and Replacement Check

USB FDD is connected to USB port on system board and US board. US board is also connected to system board by cable. The connection of cable and board may be defective. Otherwise, they may be faulty. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures* and perform the following checks.

USB FDD can be connected to the following 4 ports on system board.





Check 1 Make sure USB FDD is firmly connected to USB port. If the connection is loose, connect firmly and repeat Procedure 2. If the problem still occurs, go to Check 2.

> ***NOTE:*** *When checking the connection, be sure to check it with care for the followings.*
>
> 1. *Cable can not be disconnected from the connector.*
> 2. *Cable is connected straight to the connector.*
> 3. *Cable is connected all the way seated in the connector.*
> 4. *Cable can not be broken.*

Check 2 USB FDD may be faulty. Replace it with a new one. If the problem still occurs, perform Check 3.

Check 3 Connect USB FDD to each port embedded on system board.

If it does not work properly when connected to CN6, CN7, CN31, CN35 or all ports, perform Check 4.

Check 4 System board may be faulty. Replace it with a new one following the steps in Chapter 4, *Replacement Procedures*.

2.6 2.5” HDD Troubleshooting

To check if 2.5” HDD is malfunctioning or not, follow the troubleshooting procedures below as instructed.

Procedure 1: Partition Check
Procedure 2: Message Check
Procedure 3: Format Check
Procedure 4: Diagnostic Test Program Execution Check
Procedure 5: Connector Check and Replacement Check

> ***CAUTION**: The contents of the hard disk will be erased when the 2.5” HDD troubleshooting procedures are executed. Transfer the contents of the hard disk to floppy disks or other storage drive(s). For the backup, refer to the User’s Manual.*

Procedure 1 Partition Check

Insert the Toshiba MS-DOS system disk and start the computer. Perform the following checks:

Check 1 Input **C:** and press **Enter**. If you cannot change to drive C, go to Check 2. If you can change to drive C, go to Procedure 2.

Check 2 Input **FDISK** and press **Enter**. Choose Display Partition Information from the FDISK menu. If drive C is listed in the Display Partition Information, go to Check 3. If drive C is not listed, return to the FDISK menu and choose the option to create a DOS partition or a logical DOS drive on drive C. If the problem still occurs, go to Procedure 2.

Check 3 If drive C is listed as active in the FDISK menu, go to Check 4. If drive C is not listed as active, return to the FDISK menu and choose the option to set the active partition for drive C. Then go to Procedure 2.

Check 4 Remove the system disk from the FDD and reboot the computer. If the problem still occurs, go to Procedure 2. Otherwise, the 2.5” HDD is operating normally.

Procedure 2 Message Check

When the power is turned on, the system performs the Initial Reliability Test (IRT) installed in the BIOS ROM. When the test detects an error, an error message is displayed on the screen.

Make sure no floppy disk is in the FDD. Turn on the computer and check the message on the screen. When an OS starts from the 2.5" HDD, go to Procedure 3. Otherwise, start with Check 1 below and perform the other checks as instructed.

Check 1 If any of the following messages appear, go to Procedure 3. If the following messages do not appear, perform Check 2.

`HDC ERROR`

or

`HDD #X ERROR` (After 5 seconds this message will disappear.)

Check 2 If either of the following messages appears, go to Check 3. If the following messages do not appear, perform Check 4.

```
Insert system disk in drive
Press any key when ready .....
```

or

```
Non-System disk or disk error
Replace and press any key when ready
```

Check 3 Using the SYS command of the MS-DOS, transfer the system to the 2.5" HDD. If the system is not transferred, go to Procedure 3. Refer to the MS-DOS Manual for detailed operation.

If the following message appears on the display, the system program has been transferred to the HDD.

```
System Transferred
```

If an error message appears on the display, perform Check 4.

Check 4 2.5" HDD(s) and the connector(s) of system board may be defective (Refer to the steps described in Chapter 4, *Replacement Procedures* for disassembling.). Insert HDD(s) to the connector(s) firmly. If it is (or they are) firmly connected, go to Procedure 3.

Procedure 3 Format Check

The computer’s HDD is formatted using the MS-DOS FORMAT program or the physical format program of the test program. To format the HDD, start with Check 1 below and perform the other steps as required.

Refer to the MS-DOS Manual for the operation of MS-DOS. For the format by the test program, refer to the Chapter 3.

Check 1 Format an 2.5” HDD using MS-DOS FORMAT command. Type as **FORMAT C:/S/U**.

If 2.5” HDD can not be formatted, perform Check 2.

Check 2 Using the MS-DOS FDISK command, set the 2.5” HDD partition. If the partition is not set, go to Check 3. If it is set, format 2.5” HDD using MS-DOS FORMAT command.

Check 3 Using the Diagnostic Disk, format 2.5” HDD with a format option (physical format). If HDD is formatted, set the 2.5” HDD partition using MS-DOS FDISK command.

If you cannot format 2.5” HDD using the Tests and Diagnostic program, go to Procedure 4.

Procedure 4 Diagnostic Test Program Execution Check

The HDD test program is stored in the Diagnostics Disk. Perform all of the HDD tests in the Hard Disk Drive Test. Refer to Chapter 3, *Tests and Diagnostics,* for more information about the HDD test program.

If an error is detected during the HDD test, an error code and status will be displayed. The error codes and statuses are described in Table 2-8. If an error code is not displayed but the problem still occurs, go to Procedure 5.

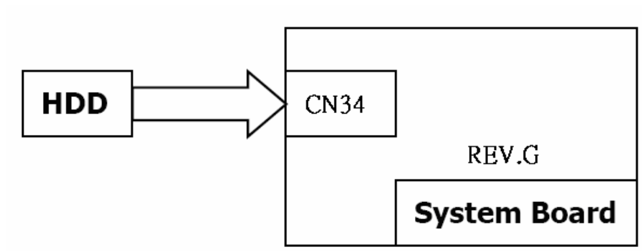
Table 2-8 2.5" Hard disk drive error code and status

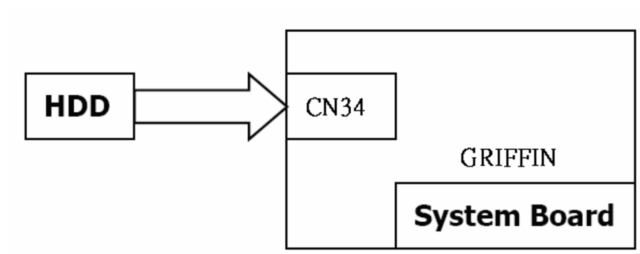
Code	Status
05	HDD - HDC NOT RESET ERROR
07	HDD - DRIVE NOT INITIALIZE
09	HDD - DMA BOUNDARY ERROR
0B	HDD - BAD TRACK ERROR
BB	HDD - UNDEFINED ERROR
08	HDD - OVERRUN ERROR (DRQ ON)
01	HDD - BAD COMMAND ERROR
02	HDD - ADDRESS MARK NOT FOUND
04	HDD - RECORD NOT FOUND ERROR
10	HDD - ECC ERROR
20	HDD - HDC ERROR
40	HDD - SEEK ERROR
80	HDD - TIME OUT ERROR
11	HDD - ECC RECOVER ENABLE
AA	HDD - DRIVE NOT READY
CC	HDD - WRITE FAULT
E0	HDD - STATUS ERROR
0A	HDD - BAD SECTOR
EE	HDD - ACCESS TIME ERROR
DA	HDD - NO HDD
12	HDD - DMA CRC ERROR

Procedure 5 Connector Check and Replacement Check

HDD(s) is/are connected to the connector(s) on the system board. The connection of HDD(s) and board may be defective. Otherwise, they may be faulty. Disassemble the computer following instructions in Chapter 4, *Replacement Procedures* and perform the following checks.

Check 1 Make sure HDD(s) is/are firmly connected to the connector(s) on the system board.





If any of the connections are loose, reconnect firmly and repeat Procedure 1. If the problem still occurs, go to Check 2.

Check 2 (One of) HDD(s) may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures* and check the operation. If the problem still occurs, perform Check 3.

Check 3 System board may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*.

2.7 Keyboard Troubleshooting

To check if the computer's keyboard is malfunctioning or not, follow the troubleshooting procedures below as instructed.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

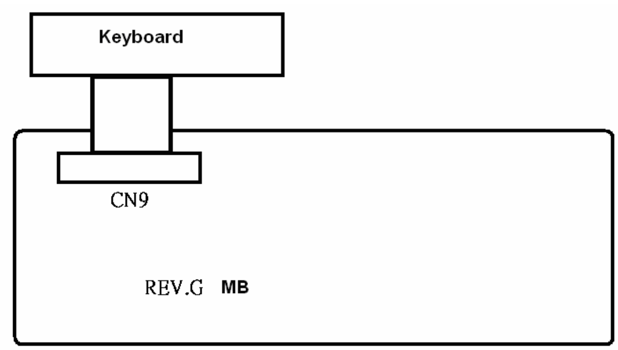
Execute the Keyboard Test (DIAGNOSTIC TEST) and Pressed key display test (ONLY ONE TEST) in the Diagnostic Program. Refer to Chapter 3, *Tests and Diagnostics*, for more information on how to perform the test program.

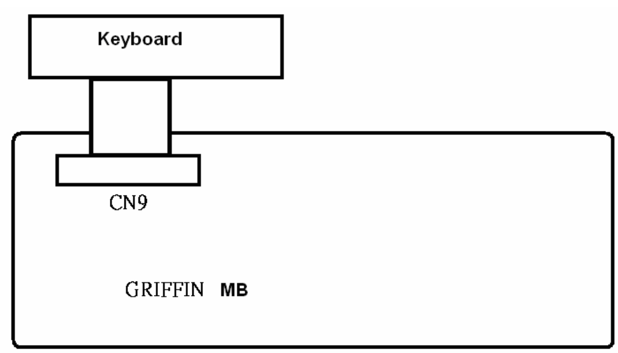
If an error occurs, go to Procedure 2. If an error does not occur, keyboard is functioning properly.

Procedure 2 Connector and Replacement Check

The connection of cable and board may be defective. Otherwise, they may be faulty. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*, and perform the following checks:

Check 1 Make sure keyboard cable is firmly connected to system board.





If the connection is loose, reconnect firmly and repeat Procedure 1. If the problem still occurs, go to Check 2.

Check 2 Keyboard may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*. If the problem still occurs, perform Check 3.

Check 3 System board may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*.

2.8 Touch pad Troubleshooting

To check if the computer's touch pad is malfunctioning or not, follow the troubleshooting procedures below as instructed.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

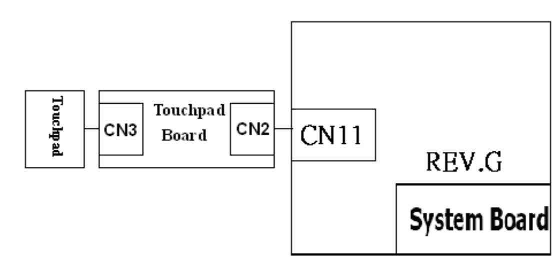
Execute the Touch pad test (ONLY ONE TEST) in the Diagnostic Program. Refer to Chapter 3, *Tests and Diagnostics*, for more information on how to perform the test program.

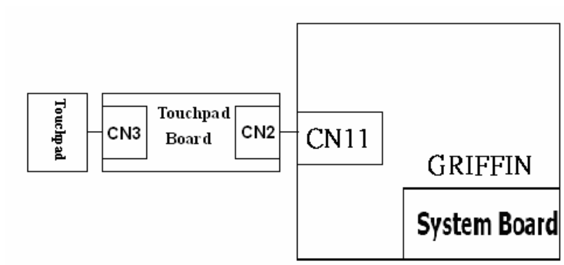
If an error occurs, go to Procedure 2. If an error does not occur, touch pad is functioning properly.

Procedure 2 Connector and Replacement Check

The connection of cable and board may be defective. Otherwise, they may be faulty. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*, and perform the following checks:

Check 1 Make sure the cable is firmly connected to system board.





If the connection is loose, reconnect firmly and repeat Procedure 1. If the problem still occurs, go to Check 2.

Check 2 Touch Pad or the cable may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*. If the problem still occurs, perform Check 3.

Check 3 System board may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*

2.9 Display Troubleshooting

To check if the computer's display is malfunctioning or not, follow the troubleshooting procedures below as instructed.

Procedure 1: External Monitor Check
Procedure 2: Diagnostic Test Program Execution Check
Procedure 3: Connector and Cable Check
Procedure 4: Replacement Check

Procedure 1 External Monitor Check

Connect an external monitor to the computer's external monitor port, then boot the computer. The computer automatically detects the external monitor.

If the external monitor works correctly, the internal LCD may be faulty. Go to Procedure 3.

If the external monitor appears to have the same problem as the internal monitor, system board may be faulty. Go to Procedure 2.

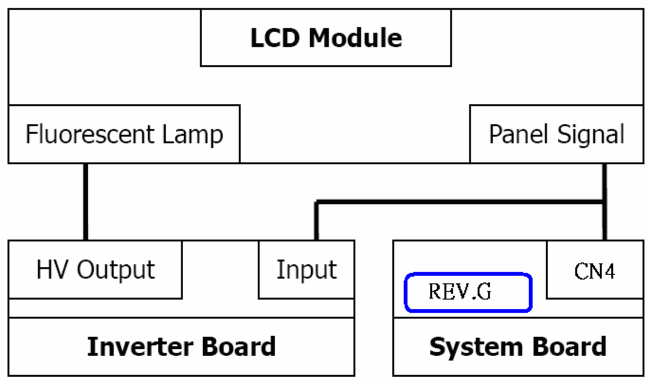
Procedure 2 Diagnostic Test Program Execution Check

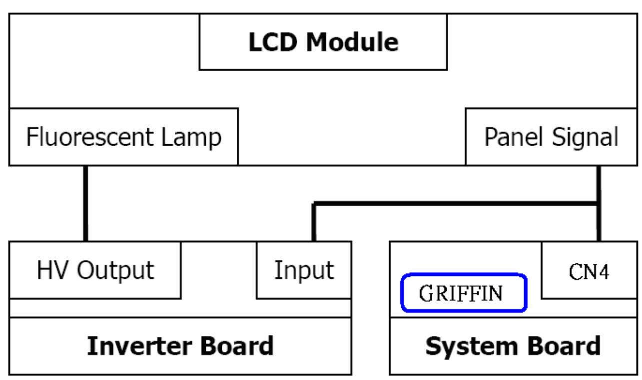
The Display Test program is stored in Diagnostics disk. This program checks the display controller on system board. Insert the Diagnostics disk in the USB FDD, turn on the computer and run the test. Refer to Chapter 3, *Tests and Diagnostics* for details. If an error is detected, go to Procedure 3.

Procedure 3 Connector and Cable Check

LCD Module is connected to system board by an LCD/FL cable. FL inverter board is also connected to system board by an LCD/FL cable. And, fluorescent lamp is connected to FL inverter board by HV cable. Their cables may be disconnected from system board or FL inverter board. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*.

If the connection is loose, reconnect firmly and restart the computer. If the problem still occurs, go to Procedure 4.





Procedure 4 Replacement Check

Fluorescent lamp, FL inverter, LCD module, HV cable and LCD/FL cable are connected to display circuits. Any of these components may be faulty. Refer to Chapter 4, *Replacement Procedures,* for instructions on how to disassemble the computer and then perform the following checks:

If fluorescent lamp does not light, perform Check 1.

If characters or graphics on the internal display are not displayed clearly, perform Check 4.

If some screen functions do not operate properly, perform Check 4.

If fluorescent lamp remains lit when the display is closed, perform Check 5.

Check 1 Replace fluorescent lamp with a new one following the instructions in Chapter 4, *Replacement Procedures* and test the display again. If the problem still occurs, perform Check 2.

Check 2 LCD/FL cable may be faulty. Replace FL/LCD cable with a new one following the instructions in Chapter 4, *Replacement Procedure* and test the display again. If the problem still occurs, perform Check 3.

Check 3 FL inverter may be faulty. Replace FL inverter with a new one following the instructions in Chapter 4, *Replacement Procedure* and test the display again. If the problem still occurs, perform Check 4.

Check 4 LCD module may be faulty. Replace LCD module with a new one following the instructions in Chapter 4, *Replacement Procedure* and test the display again. If the problem still occurs, perform Check 5.

Check 5 System board may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedure*.

2.10 Optical Disk Drive Troubleshooting

To check if optical disk drive is malfunctioning or not, follow the troubleshooting procedures below as instructed.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

Execute the CD-ROM/DVD-ROM Test in the Diagnostic Program. Refer to Chapter 3, *Tests and Diagnostics* for more information on how to perform the test program.

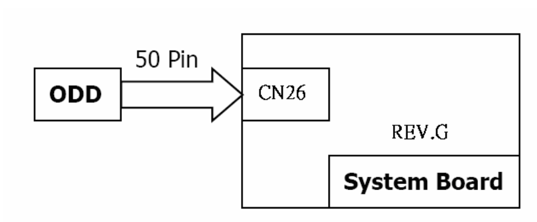
Prepare the tools before the test.

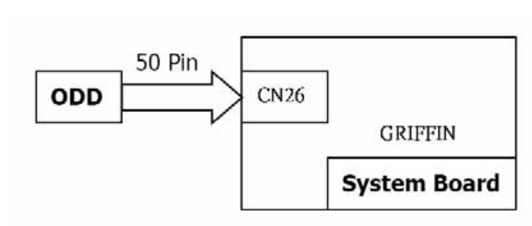
If any error is detected by the test, go to Procedure 2.

Procedure 2 Connector Check and Replacement Check

The connection of optical disk drive and system board may be defective. Otherwise, they may be faulty. Disassemble the computer following the steps described in Chapter 4 and perform the following checks:

Check 1 Make sure optical disk drive is firmly connected to the connector on system board.





If the connection is loose, reconnect it firmly and return to Procedure 2. If the problem still occurs, perform Check 2.

Check 2 Optical disk drive may be faulty. Replace it with a new one following the steps in

Chapter 4. If the problem still occurs, perform Check 3.

Check 3 System board may be faulty. Replace it with new one following the instructions in Chapter 4.

2.11 Modem Troubleshooting

To check if modem is malfunctioning or not, follow the troubleshooting procedures below as instructed.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

Execute Modem test in the LAN/Modem/Bluetooth/IEEE1394 test program. Refer to Chapter 3, *Tests and Diagnostics* for more information on how to perform the test program.

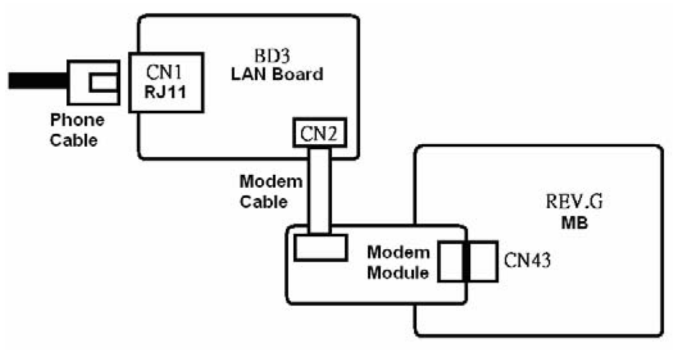
If any error is detected, perform Procedure 2.

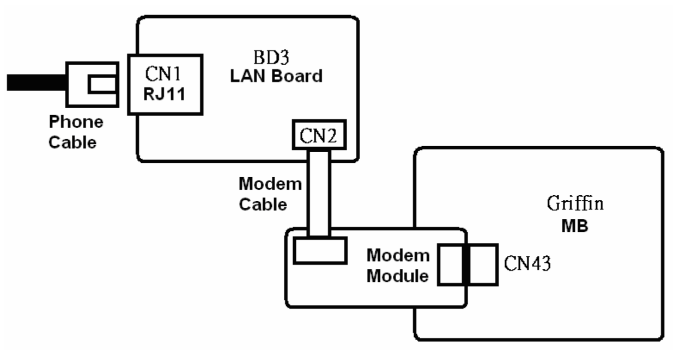
Procedure 2 Connector Check and Replacement Check

MDC (Modem Daughter Card) is used as the modem for this computer. MDC is connected to system board by connector CN43(REV.G) or CN43(GRIFFIN). And also, MDC is connected to system and LAN board by modem cable. If modem malfunctions, the connection of cable, board and module may be defective. Otherwise, they may be faulty.

Disassemble the computer following the steps described in Chapter 4 and perform the following checks:

Check 1 Make sure the following connections are firmly connected.





If any connector is disconnected, connect it firmly and return to Procedure 1. If the problem still occurs, perform Check 2.

Check 2 Modem cable may be faulty. Replace it with a new one. If the problem still occurs, perform Check 3.

Check 3 MDC may be faulty. Replace it with a new one following the steps in Chapter 4. If the problem still occurs, perform Check 4.

Check 4 Cable between MDC and system board may be faulty. Replace it with a new one following the instructions in Chapter 4. If the problem still occurs, perform Check 5.

Check 6 System board may be faulty. Replace it with a new one following the instruction in Chapter 4.

2.12 LAN Troubleshooting

To check if the computer's LAN is malfunctioning or not, follow the troubleshooting procedures below as instructed.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

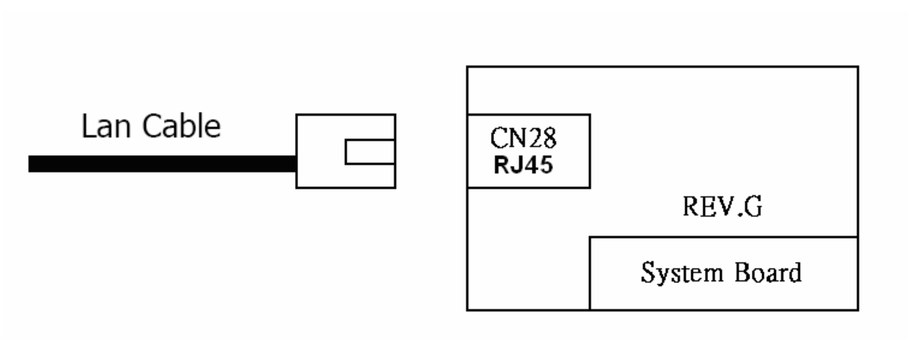
Execute LAN test in the LAN/Modem test program. Refer to Chapter 3, *Tests and Diagnostics* for more information on how to perform the test program.

If any error is detected by the test, go to Procedure 2.

Procedure 2 Connector Check and Replacement Check

The LAN function is embedded on system board. If LAN malfunctions, its connection is defective or LAN cable and system board may be faulty.

Check 1 Make sure LAN cable is firmly connected to the connector CN9. If the problem still occurs, perform Check 2.



Check 2 LAN cable may be faulty. Replace it with a new one. If the problem still occurs, perform Check 3.

Check 3 System board may be faulty. Replace it with a new one following the instruction in Chapter 4.

2.13 Wireless LAN Troubleshooting

To check if the computer's Wireless LAN is malfunctioning or not, follow the troubleshooting procedures below as instructed.

Procedure 1: Transmitting-Receiving Check

Procedure 2: Antennas' Connection Check

Procedure 3: Replacement Check

Procedure 1 Transmitting-Receiving Check

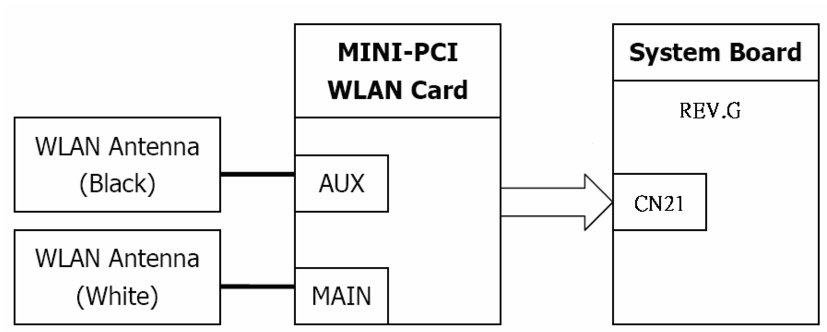
Before starting the test, make sure the wireless communication switch is set in the ON position.

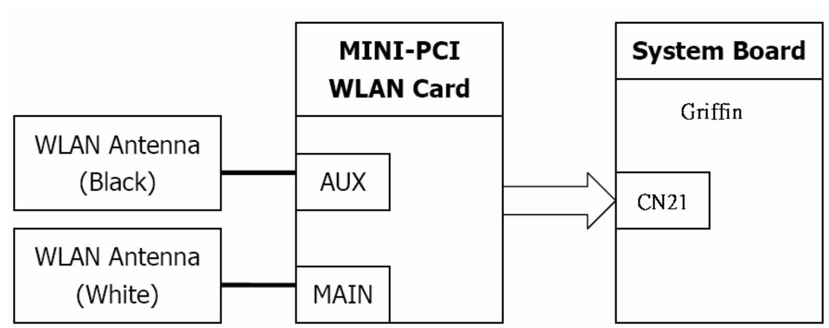
Check 1 Execute Wireless LAN test program to check the transmitting-receiving function of wireless LAN. You will need a second computer that can communicate by wireless LAN. Perform the test following the instructions described in Chapter 3.

If the computer passes the test, the function is correctly working. If the computer does not pass the test, perform Procedure 2.

Procedure 2 Antennas' Connection Check

The wireless LAN function-wiring diagram is shown below:





Any of the connections may be defective. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*, and perform the following checks:

Check 1 Make sure the wireless communication switch is “On”.

If the switch is “Off”, turn it “On”. If the problem still occurs, perform Check 2.

Check 2 Make sure wireless LAN card (Mini-PCI) is firmly connected to the CN21 on system board. If the connector is defective, connect it firmly and perform Procedure 1. If the problem still occurs, perform Check 3.

Check 3 Make sure that wireless LAN antenna cables (black and white) are firmly connected to the connectors on Wireless LAN card. If wireless LAN antenna cables are not connected properly, connect them firmly and perform Procedure 1. If the problem still occurs, go to the procedure 3.

Procedure 3 Replacement Check

Wireless LAN card, wireless LAN antenna or system board may be faulty. Refer to Chapter 4, *Replacement Procedures,* for instructions on how to disassemble the computer and then perform the following checks:

Check 1 Wireless LAN antenna may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*. If the problem still occurs, perform Check 2.

Check 2 Wireless LAN card may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*. If the problem still occurs, perform Check 3.

Check3 System board may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*.

2.14 Sound Troubleshooting

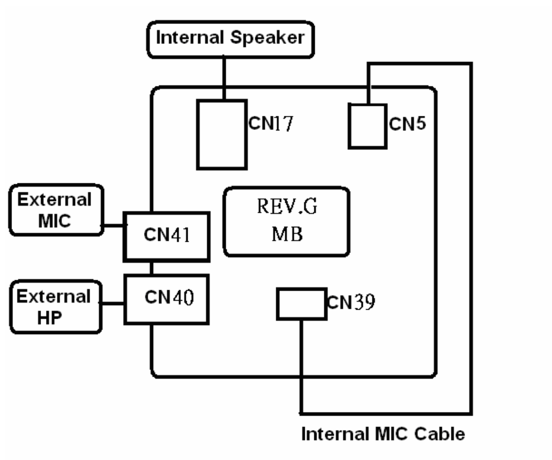
To check if the sound function is malfunctioning or not, follow the troubleshooting procedures below as instructed.

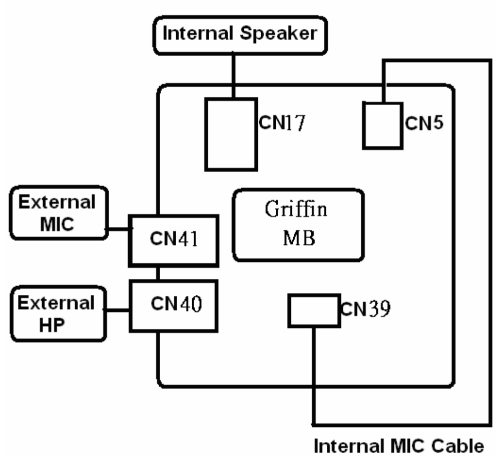
Procedure 1: Connector Check

Procedure 2: Replacement Check

Procedure 1 Connector Check

The connection of sound system is shown in the following figure.





As the connection may be defective, disassemble the PC and check each connection.

If the problem still occurs, go to Procedure 2.

Procedure 2 Replacement Check

- ❑ If External microphone/Headphone does not work properly, perform check 1.
- ❑ If Internal microphone /Speaker does not work properly, perform check 2.
- ❑ If HP out does not work properly, perform check 3.
- ❑ If Volume control does not work properly, perform check 4.

Check 1 External microphone/Headphone may be faulty. Replace it with a new one following the steps in Chapter 4.

Check 2 Internal microphone /Speaker may be faulty. Replace it with a new one following the steps in Chapter 4. If the problem still occurs, perform Check 5.

Check 3 HP out may be faulty. Replace it with a new one following the steps in Chapter 4.

Check 4 Volume control may be faulty. Replace it with a new one following the steps in Chapter 4.

Check 5 Flat cable between CN5 and CN39 may be faulty. Replace it with new cable following the instructions in Chapter 4.

2.15 Fingerprint Troubleshooting

To check if the computer's Fingerprint is malfunctioning or not, follow the troubleshooting procedures below as instructed.

Procedure 1: Connector Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

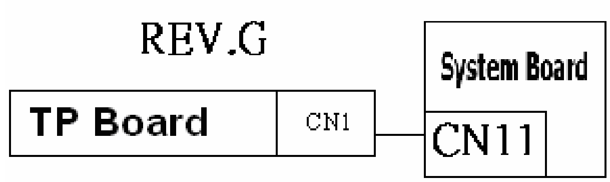
Execute Fingerprint test in the test program. Refer to Chapter 3, *Tests and Diagnostics* for more information on how to perform the test program.

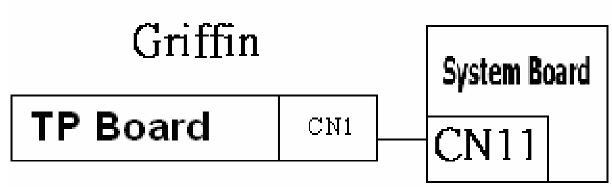
If any error is detected, perform Procedure 2.

Procedure 2 Connector Check and Replacement Check

The Fingerprint function is embedded on system board. If Fingerprint malfunctions, its connection is defective or Fingerprint cable and system board may be faulty.

Check 1 Make sure Fingerprint cable is firmly connected to the connector CN11**(REV.G) or CN11(Griffin)**. If the problem still occurs, perform Check 2.





Check 2 Fingerprint cable may be faulty. Replace it with a new one. If the problem still occurs, perform Check4.

Check 3 Fingerprint may be faulty. Replace it with a new one following the steps in Chapter 4. If the problem still occurs, perform Check 4.

Check 4 System board may be faulty. Replace it with a new one following the instruction in

Chapter 4.

2.16 Bluetooth Troubleshooting

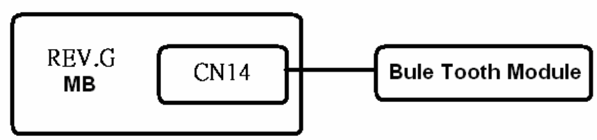
To check if the computer's B**lue**tooth is malfunctioning or not, follow the troubleshooting procedure below as instructed.

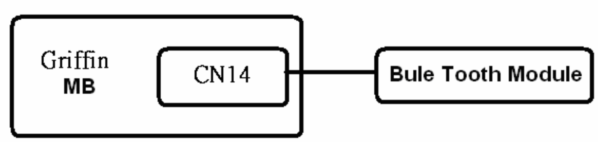
Procedure 1: Connector Check and Replacement Check

Procedure 1 Connector Check and Replacement Check

The B**lue**tooth function is connected to system board. If B**lue**tooth malfunctions, its connection is defective or B**lue**tooth cable and system board may be faulty.

Check 1 Make sure B**lue**tooth cable is firmly connected to the connector CN**14(REV.G) or CN14(Griffin)**. If the problem still occurs, perform Check 2.





Check 2 B**lue**tooth cable may be faulty. Replace it with a new one. If the problem s till occurs, perform Check 3.

Check 3 B**lue**tooth may be faulty. Replace it with a new one following the steps in Chapter 4. If the problem still occurs, perform Check 4.

Check 4 System board may be faulty. Replace it with a new one following the instruction in Chapter 4.

Chapter 3

Diagnostic Programs

Chapter 3 Contents

3.1 Tests and Diagnostics Software Overview

This chapter explains how to use the Tests and Diagnostics Software for the Satellite P300 and Satellite Pro P300 computer systems.

> ***NOTES**: Before starting the Tests and Diagnostics software:*
>
> 1. *Check all cables for loose connections.*
> 2. *Exit any application and close Windows.*

The Diagnostics Menu consists of the following options:

- ❑ Diagnostic Test
- ❑ Running Test
- ❑ DMI Information
- ❑ Log Utilities
- ❑ System Configuration
- ❑ Option

The Diagnostic Test Menu consists of the following functional tests:

- ❑ System Test
- ❑ Memory Test
- ❑ Keyboard Test
- ❑ Display Test
- ❑ Floppy Disk Test
- ❑ Hard Disk Test
- ❑ Real Time Clock Test
- ❑ Cache Memory Test
- ❑ High Resolution Display Test
- ❑ Multimedia Test
- ❑ Memory2 Test
- ❑ FDD & HDD Error Retry Count Set

The following equipment is required to perform some of the diagnostic test programs:

- ❑ The Diagnostics Disk (all tests)
- ❑ A formatted working disk for the floppy disk drive test (all tests)
- ❑ A CD test media (Toshiba Backup CD ROM for the CD-ROM test)

The following sections detail the tests contained within the Diagnostic Test Menu. Refer to Sections 3.18, 3.19, 3.20 and, 3.21 for detailed information on the remaining functions of the Tests and Diagnostics software.

3.2 Executing the Diagnostic Test

DOS is required to run the Diagnostics Program. To start the programs follow these steps:

1. Create a DOS bootable disk and copy all the files from the Tests and Diagnostics software to the disk.

2. Insert the boot disk into the computer's floppy disk drive and turn on the computer.

   The following screen displays:

```
TOSHIBA Satellite(Pro) P300 Diagnostics          ↑↓→←:Select item
Version v1.10                                    ESC  :Escape

   [ DIAGNOSTICS MENU ]

01.DIAGNOSTIC TEST
02.RUNNING TEST
03.DMI INFORMATION
04.LOG UTILITIES
05.SYSTEM CONFIGURATION
06.OPTION
99.EXIT
```

3. To select the Diagnostic Test from the Diagnostics Menu use the arrow keys to set the highlight bar to **01** and press **Enter**.

The following menu displays:

```
TOSHIBA Satellite(Pro) P300 Diagnostics          ↑↓→←:Select item
Version V1.10                                    ESC :Escape

  [ DIAGNOSTICS MENU ]

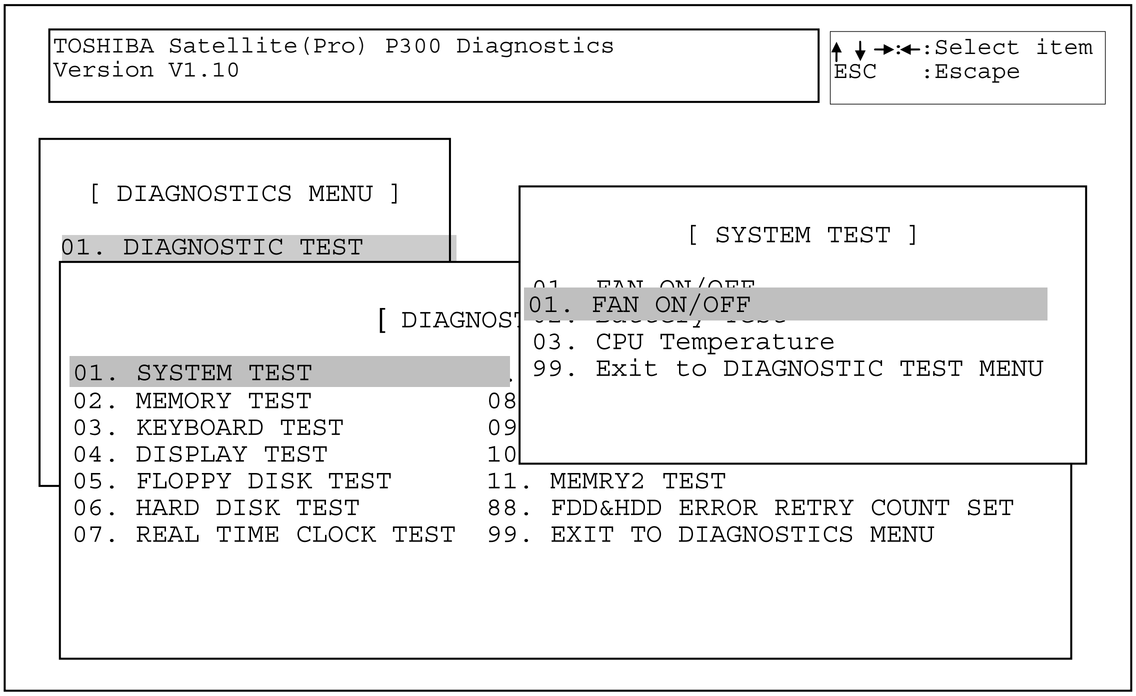
 01. DIAGNOSTIC TEST

                      [ DIAGNOSTIC TEST MENU ]

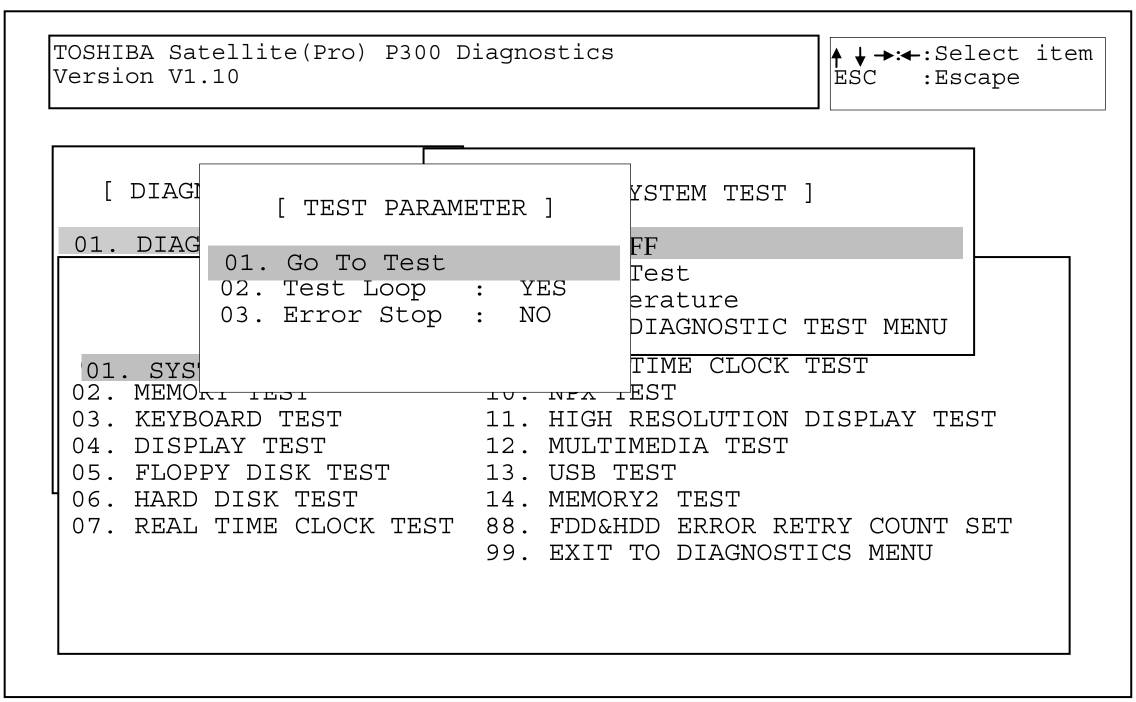
01. SYSTEM TEST                08. CACHE MEMORY TEST
02. MEMORY TEST                09. HIGH RESOLUTION DISPLAY TEST
03. KEYBOARD TEST              10. MULTIMEDIA TEST
04. DISPLAY TEST               11. MEMORY2 TEST
05. FLOPPY DISK TEST           88. FDD&HDD ERROR RETRY COUNT SET
06. HARD DISK TEST             99. EXIT TO DIAGNOSTICS MENU
07. REAL TIME CLOCK TEST
```

Refer to Sections 3.4 through 3.14 for detailed descriptions of Diagnostics Tests 1 through 11. Item 88 sets the floppy disk drive and hard disk drive error retry count. Item 99 exits the submenu of the Diagnostic Test and returns to the Diagnostics Menu.

4. Select the subtest you want to execute and press **Enter**. The following menu displays:



5. Select the desired test from the subtest menu and press **Enter**. The following Test Parameter menu displays:



Use the arrow keys to highlight the desired option and press **Enter**.

> ***NOTES**: The Item2 and 3 of Test Parameter are not used by some tests.*

Go To Test
Move the highlight bar to *Go To Test* and press **Enter** to start executing the test.

Test Loop
Select **NO** to return the screen to the subtest menu after the test is complete.
Select **YES** to set the test to run continuously until it is halted by the user.

Error Stop
Select **NO** to keep the test running even if an error is found.
Select **YES** to stop the test program when an error is found and display the HALT OPERATION screen as shown below:

```
[[ HALT OPERATION ]]
  1: Test end
  2: Continue
  3: Retry
```

These three selections have the following functions:

1: Terminates the test program and exits to the subtest menu.
2: Continues the test from the error.
3: Restarts the test from the beginning.

Use the arrow keys to move the cursor to the desired option and press **Enter**.
Table 3-1 in Section 3.3 lists the function of each test on the subtest menu. Table 3-2 in Section 3.15 lists the error codes and error status for each error.

3.3 Subtest names

Table 3-1 lists the subtest names for each test program in the Diagnostic Test menu.

Table 3-1 Subtest Names(1/3)

No.	Test Name	No.	Subtest Name
01	SYSTEM TEST	01	FAN ON/OFF check
		02	Battery TEST
		03	CPU Temperature
02	MEMORY TEST	01	Conventional Memory
		02	Protected Mode
		03	Protected Mode (32MB-MAX)
		04	RAM Refresh
		05	Stress Test
03	KEYBOARD TEST	01	Pressed Key Display [109 KBD]
		02	Pressed Key Display [105 KBD]
		03	Pressed Key Display [104 KBD]
		04	Hot Key Display [7 KBD]
		05	Hot Key Display [1 KBD]
		06	PS/2 Mouse (Pointing 2Button)
04	DISPLAY TEST	01	Character Attributes
		02	Character Set
		03	80* 25 Character Display
		04	320* 200 Graphics Display
		05	640* 200 Graphics Display
		06	640* 480 Graphics Display
		07	Display Page
		08	“H” Pattern Display
		09	Video DAC Register W/R/C
		10	Color Graphics Display
		11	Color Attributes Display
		12	Color Tiling

Table 3-1 Subtest Names(2/3)

No.	Test Name	No.	Subtest Name
05	FLOPPY DISK TEST	01	Sequential Read
		02	Sequential W/R/C
		03	Random Address/Data
		04	Write Specified Address
		05	Read Specified Address
06	HARD DISK TEST	01	Sequential Read
		02	Address Uniqueness
		03	Random Address Data
		04	Cross Talk and Peek Shift
		05	Write Specified Address
		06	Read Specified Address
		07	Sequential Write
		08	W-R-C Specified Address
07	REAL TIME CLOCK TEST	01	Real Time Test
		02	Backup Memory Test
		03	Real Time Carry Test
08	CACHE MEMORY TEST	01	Constant Data Test
		02	Address Pattern Test
		03	Increment/Decrement Test
		04	Bit Shift Pattern Test
		05	*Write Disturb Test
		06	Checker Board Test
		07	Marching Test
		08	Working Data Test
09	HIGH RESOLUTION	01	VRAM W/R/C Test
	DISPLAY TEST	02	640* 480 Mode Display
		03	800* 600 Mode Display
		04	1024* 768 Mode Display
		05	“H” Pattern Display
		06	Focus Test (“E” Pattern)

Table 3-1 Subtest Names(3/3)

No.	Test Name	No.	Subtest Name
10	MULTIMEDIA TEST	01	Sequential Read Test
		02	Random Read Test
		03	Read Specified Address Test
		04	1 point W/R/C Test
11	MEMORY2	01	All one/zero Test
		02	Walking 1/Walking 0 Test(Left)
		03	Walking 1/Walking 0 Test(Right)
		04	Walking 1/Walking 0 Test(Left /Right)

**This test cannot support.*

3.4 System Test

To execute the System Test select **01** from the Diagnostic Test Menu, press **Enter** and follow the directions on the screen. The System Test contains three subtests. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01 FAN ON/OFF Checking

Select 1,2,3 to control FAN on/off , 1=Fan on , 2=Fan off , 3=Exit .

[BU1FAN.EXE] Program Version : 1.0
1: Fan On 2: Fan Off 3: Exit
Fan1 Status On Fan1RPM : 5000 or Fan1 Status OFF Fan1RPM : 0

Subtest 02 Battery Test

This will display battery information for check , press [ESC] to exit .

[BOIPCU.EXE] Program Version : 1.0 03-27-2007

voltage	: 12522 mV	Remaining capacity alarm	: 400 mAh
temperature	: 24.4 ‘C	Remaining time alarm	: 10 min
current	: 1330 mA	Battery mode	: 0
average current	: 1327 mA	AtRate	: 0 mA
relative state of charge	: 93 %	At rate time to full	: 65535 min
absolute state of charge	: 89 %	At rate time to empty	: 65535 min
remaining capacity	: 3546 mAh	At rate O. K.	: FFFF
full charge capacity	: 3800 mAh	Maximun error	: 2 %
run time to empty	: -1 min.	Charging current	: 2800 mA
average time to empty	: -1 min.	Charging voltage	: 12600 mA
average time to full	: 101 min.	Manufacturer name	: SANYO
cycle count	: 10 times	Device name	: NS2P3SZDNVWR
design capacity	: 4000 mAh	Device chemistry	: LION
design voltage	: 11100 mV	Manufacturer data	: 0
specification information	: 2.1	Manufacture date	: 9/13/2005
serial no.	: 32009		
STATUS	: INIT		

Press [ESC] KEY to exit

Subtest 03 CPU Temperature

This will display CPU Temperature for check , press [ESC] to exit .

[CPU_TEMP.EXE] Program Version : 1.0 03-27-2007

CPU Temperature : XX

3.5 Memory Test

To execute the Memory Test select **02** from the Diagnostic Test Menu, press **Enter** and follow the directions on the screen. The Memory Test contains five subtests that test the computer's memory. Move the highlight bar to the subtest you want to execute and press **Enter**.

> ***NOTE***: *If* ***NO*** *is selected for Test Loop on the Test Parameter menu, the Test Status screen displays while the test is executing. When the test is complete the Memory Test menu displays.*
>
> *If* ***YES*** *is selected for Test Loop on the Test Parameter menu, the Test Status screen displays while the test is executing. Press* ***Ctrl + break*** *to return to the Memory Test menu.*

Subtest 01 Conventional Memory

This subtest first writes test data patterns to conventional memory (0 to 640 KB), then reads the new data and compares the result with the original data patterns.

If a compare error occurs, the write data, read data, and test address display on the screen. Addresses are displayed in 4KB increments during the test.

Test Process:

1. Byte Enable Test
   One bit write/ 8 bit read" is executed and the new data is compared with the original data.
   Test data = CCAA5533H, 80000000H

2. Byte Enable Test
   "One bit write/16 bit read" is executed and the new data is compared with the original data.
   Test data = CCAA5533H, 80000000H

3. Data bus test
   "One bit write/16 bit read" is executed and the new data is compared with the original data.
   Test data = 1H, 2H, 4H, 8H, 10H, through 80000000H.

4. Fixed data test
   "16 bit write/ 16 bit read" is executed and the new data is compared to the original data.
   Test data = FFFFFFFFH, 00000000H, 80018001H

5. Address pattern test
   "16 bit write and 16 bit read" of address pattern data is executed and the new data is compared with the original data.
   Test data = 0000H, 0004H, 0008H, 000CH,...8000H, 8004H, through FFECH

Subtest 02 Protected Mode

This subtest first writes data patterns and address data from 1 to 32 MB, then reads the new data and compares the result with the original data patterns. Addresses are displayed in 64KB increments during the test.

. **Test Process:**

1. Byte Enable Test
   One bit write/ 8 bit read" is executed and the new data is compared with the original data.
   Test data = CCAA5533H, 80000000H

2. Byte Enable Test
   "One bit write/16 bit read" is executed and the new data is compared with the original data.
   Test data = CCAA5533H, 80000000H

3. Data bus test
   "One bit write/16 bit read" is executed and the new data is compared with the original data.
   Test data = 1H, 2H, 4H, 8H, 10H, through 80000000H.

4. Fixed data test
   "16 bit write/ 16 bit read" is executed and the new data is compared to the original data.
   Test data = FFFFFFFFH, 00000000H, 80018001H
5. Address pattern test
   "16 bit write and 16 bit read" of address pattern data is executed and the new data is compared with the original data.
   Test data = 0000H, 0004H, 0008H, 000CH,...8000H, 8004H, through FFECH

Subtest 03 Protected Mode [32MB - MAX]

This subtest first writes data patterns and address data from 32MB to the maximum installed memory, reads the new data, and then compares the result

with the original data patterns. Addresses are displayed in 64KB increments during the test.

Test Process:

1. Byte Enable Test
   One bit write/ 8 bit read" is executed and the new data is compared with the original data.
   Test data = CCAA5533H, 80000000H

2. Byte Enable Test
   "One bit write/16 bit read" is executed and the new data is compared with the original data.
   Test data = CCAA5533H, 80000000H

3. Data bus test
   "One bit write/16 bit read" is executed and the new data is compared with the original data.
   Test data = 1H, 2H, 4H, 8H, 10H, through 80000000H.

4. Fixed data test
   "16 bit write/ 16 bit read" is executed and the new data is compared to the original data.
   Test data = FFFFFFFFH, 00000000H, 80018001H
5. Address pattern test
   "16 bit write and 16 bit read" of address pattern data is executed and the new data is compared with the original data.
   Test data = 0000H, 0004H, 0008H, 000CH,...8000H, 8004H, through FFECH

Subtest 04 RAM Refresh

This subtest writes a data pattern (CCAA5533H) in 4KB from 0 to the maximum installed memory, then waits for a memory refresh cycle (16 ms or more), reads the new data, and compares the result with the original data pattern.

Test Process:

1. Checks the memory size to determine the maximum size of installed memory.

2. Tests memory addresses 0 to the maximum installed.

3. Writes, reads, and compares test data after a memory refresh cycle (16ms or more).

> ***NOTE:*** *There may be a short delay between write and read operations, depending on the memory size.*

Subtest 05 Stress Test

This subtest writes the following 16KB data patterns to the Write/Read Buffer in conventional memory.

```
data:    FFFFFFFFFFFFFFFF0000000000000000
         5555555555555555AAAAAAAAAAAAAAAA
         CCCCCCCCCCCCCCCC3333333333333333
         0000000000000000FFFFFFFFFFFFFFFF
         AAAAAAAAAAAAAAAA5555555555555555
         3333333333333333CCCCCCCCCCCCCCCC
         FFFFFFFFFFFFFFFF0000000000000000
         0000000000000000FFFFFFFFFFFFFFFF
         5555555555555555AAAAAAAAAAAAAAAA
         AAAAAAAAAAAAAAAA5555555555555555
         CCCCCCCCCCCCCCCC3333333333333333
         3333333333333333CCCCCCCCCCCCCCCC
```

3.6 Keyboard Test

To execute the Keyboard Test select **03** from the Diagnostic Test Menu, press **Enter** and follow the directions on the screen. The Keyboard Test contains five subtests that test the computer's keyboard and mouse actions. Move the highlight bar to the subtest you want to execute and press **Enter**.

> ***NOTE***: *The Test Loop and Error Stop parameters are not enabled for the Keyboard test.*

Subtest 01 Pressed Key Display [109 Keyboard]

When you execute this subtest, the keyboard layout is drawn on the display. When any key is pressed, the corresponding key on the screen changes from light to dark. Holding a key down enables the auto-repeat function which causes the key's display character to blink.

```
                [[[ Press Key Display ]]]

            Layout of a keyboard (109 keys)
```

Subtest 02 Pressed Key Display [105 Keyboard]

This subtest is used for the 105 keyboard and functions the same as Subtest 1.

Subtest 03 Pressed Key Display [104 Keyboard]

This subtest is used for the 104 keyboard and functions the same as Subtest 1.

Subtest 04 Hot Key Display [7 Key]

This subtest is used for the 7 hot key and functions the same as Subtest 1.

MUTE MUSIC PLAY STOP BACK NEXT WLAN

Subtest 05 Hot Key Display [1 Key]

This subtest is used for the 1 hot key and functions the same as Subtest 1.

WLAN

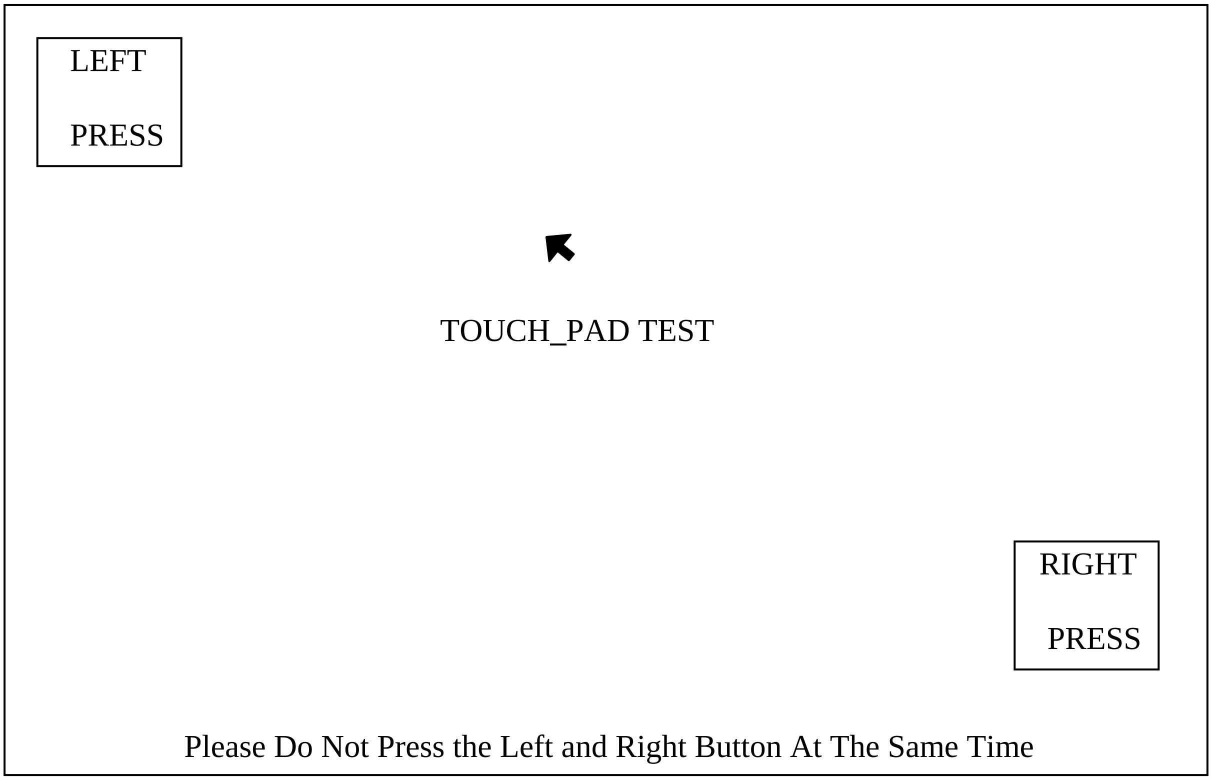
Subtest 06 PS/2 Mouse (Pointing)

This subtest checks the function of mouse as shown below.

A) Pointing device (mouse)
B) Mouse buttons

Please move cursor to upper left and press left button , screen will display <PRESS> in left rectangle , move cursor to lower right and press right button , screen will display <PRESS> in right rectangle , the program exit .

If left and right button short , screen will display <Left and Right Button maybe short > , the program exit .


LEFT
PRESS
TOUCH_PAD TEST
RIGHT
PRESS
Please Do Not Press the Left and Right Button At The Same Time

3.7 Display Test

To execute the Display Test select **04** from the Diagnostic Test Menu, press **Enter** and follow the directions displayed on the screen. The Display Test contains twelve subtests that test the display in various modes. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01 Character Attributes

This subtest displays character attributes and color attributes. The character attributes are: normal, intensified, reverse, and blinking. The color attributes are: blue, red, magenta, cyan, yellow, and white. These seven colors each display a background color, foreground color and high resolution color. The screen below displays when this subtest is executed.

```
CHARACTER ATTRIBUTES

  NEXT LINE SHOWS NORMAL DISPLAY
       NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN

 NEXT LINE SHOWS INTENSIFIED DISPLAY
       IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII

 NEXT LINE SHOWS REVERSE DISPLAY
       RRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRR

 NEXT RRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRR
       BBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBB


                        BLUE

                        RED

                        MAGENTA

                        GREEN

                        CYAN

                        YELLOW

                        WHITE

 Press  [ Enter ] KEY
```

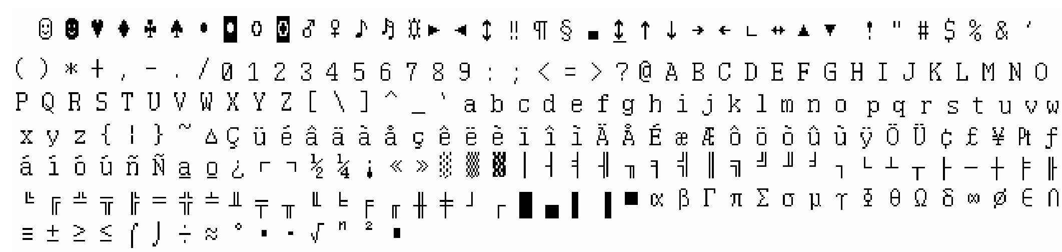
To exit this subtest and return to the Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu.
Press **Ctrl** + **break** if **YES** was selected for *Test Loop* on the Test Parameter Menu.

Subtest 02 Character Set

This subtest displays the character codes 00H - FFH, using Mode 01H (40*25). The screen below displays when this subtest is executed.

```
CHARACTER SET IN 40*25
```



```
Press  [Enter] Key
```

To exit this subtest and return to the Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu.
Press **Ctrl** + **break** if **YES** was selected for *Test Loop* on the Test Parameter Menu.

Subtest 03 80 * 25 Character Display

This subtest uses 80*25 video resolution to display character codes 20H - 7EH using Mode 03H (80*25). The data displayed is shifted 1 byte to the left for each line as shown below.

```
 80*25 CHARACTER DISPLAY
 01234567890123456789012345678901234567890123456789012345678901234567890123456789
  !”#$%&’()*=,.-/0123456789:;⇔?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_’abcdefghIjklmno
!”#$%&’()*=,.-/0123456789:;⇔?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_’abcdefghIjkl mnop
”#$%&’()*=,.-/0123456789:;⇔?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_’abcdefghIjklmnopq
#$%&’()*=,.-/0123456789:;⇔?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_’abcdefghIjklmnopqr
$%&’()*=,.-/0123456789:;⇔?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_’abcdefghIjklmnopqrs
%&’()*=,.-/0123456789:;⇔?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_’abcdefghIjklmnopqrst
&’()*=,.-/0123456789:;⇔?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_’abcdefghIjkl mnopqrstu
’()*=,.-/0123456789:;⇔?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_’abcdefghIjklmnopqrstuv

                Shifted to the left one letter by one letter.

23456789:;⇔?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_’abcdef gh I j k l mnopqrst
3456789:;⇔?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_’abcdef gh I j k l mnopqrst
456789:;⇔?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_’abcdef gh I j k l mnopqrst

 Press [Enter] KEY
```

To exit this subtest and return to the Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu.
Press **Ctrl** + **break** if **YES** was selected for *Test Loop* on the Test Parameter Menu.

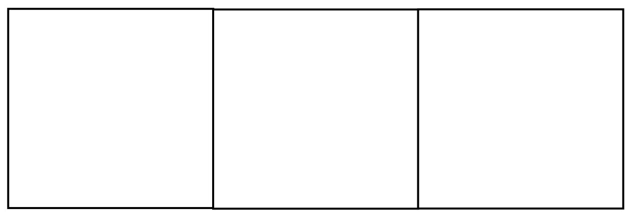
Subtest 04 320 * 200 Character Display

This subtest uses 320*200 video resolution to display green, red and yellow followed by cyan, magenta, and white. The screen below shows the displays when this subtest is executed.

```
320 * 200 GRAPHICS DISPLAY

   COLOR SET 0 : [ 4 ]

          GREEN          RED          YELLOW
          CYAN         MAGENTA        WHITE
```



Press **ENTER** to display the following sixteen colors: black, blue, green, cyan, red, magenta, brown, white, dark gray, light blue, light green, light cyan, light red, light magenta, yellow, and intensified white.

```
320*200 GRAPHICS DISPLAY   :   [ D ]
     BLACK                                        D  GRAY
     BLUE                                         L  BLUE
     GREEN                                        L  GREEN
     CYAN                                         L  CYAN
     RED                                          L  RED
     MAGENTA                                      L  MAGENTA
     BROWN                                        YELLOW
     WHITE                                        I   WHITE
Press [Enter] KEY
```

Press **ENTER** to display 64 gradations of red, green, blue and white on the screen

```
320*200 GRAPHICS DISPLAY   :   [ 13 ]

        64 gradations of red are displayed.

        64 gradations of green are displayed.

        64 gradations of blue are displayed.

        64 gradations of white are displayed.

 Press [Enter] KEY
```

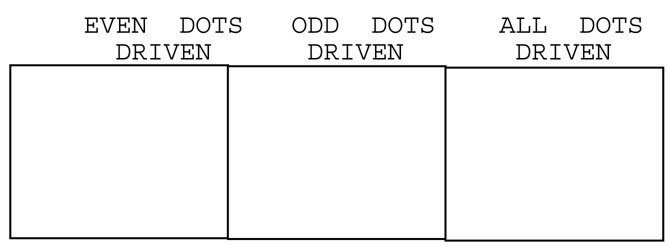
To exit this subtest and return to the Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu.
Press **Ctrl** + **break** if **YES** was selected for *Test Loop* on the Test Parameter Menu.

Subtest 05 640 * 200 Character Display

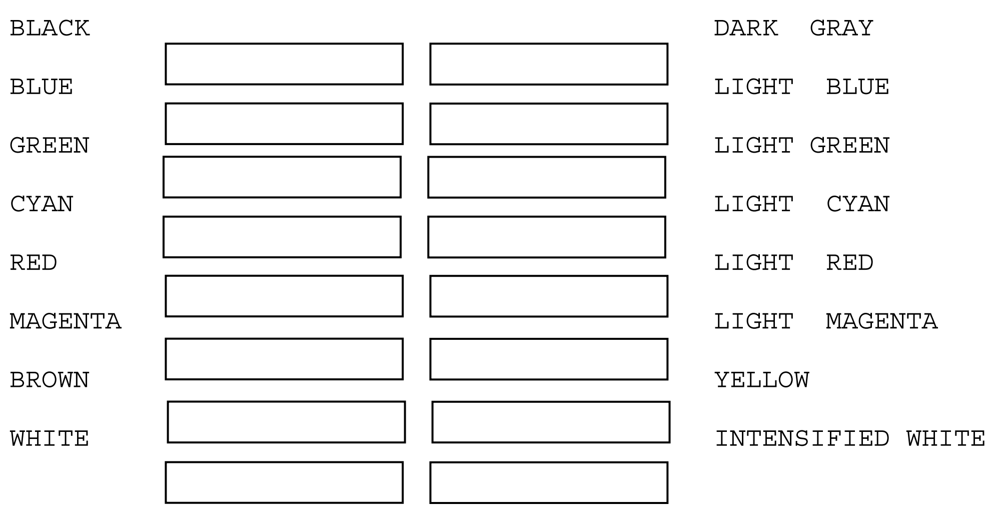
This subtest uses 640*200 video resolution to display three windows, each window drives a different set of dots: even dots, odd dots and all dots. The screen below displays when this subtest is executed.

```
640 * 200 GRAPHICS DISPLAY  : [ 6 ]
```



Press **ENTER** to display the following 16 colors: black, blue, green, cyan, red, magenta, brown, white, dark gray, light blue, light green, light cyan, light red, light magenta, yellow, and intensified white.

```
640*200 GRAPHICS DISPLAY   :   [ E ]
```




```
Press [Enter] KEY
```

To exit this subtest and return to the Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu.
Press **Ctrl** + **break** if **YES** was selected for *Test Loop* on the Test Parameter Menu.

Subtest 06 640 * 480 Character Display

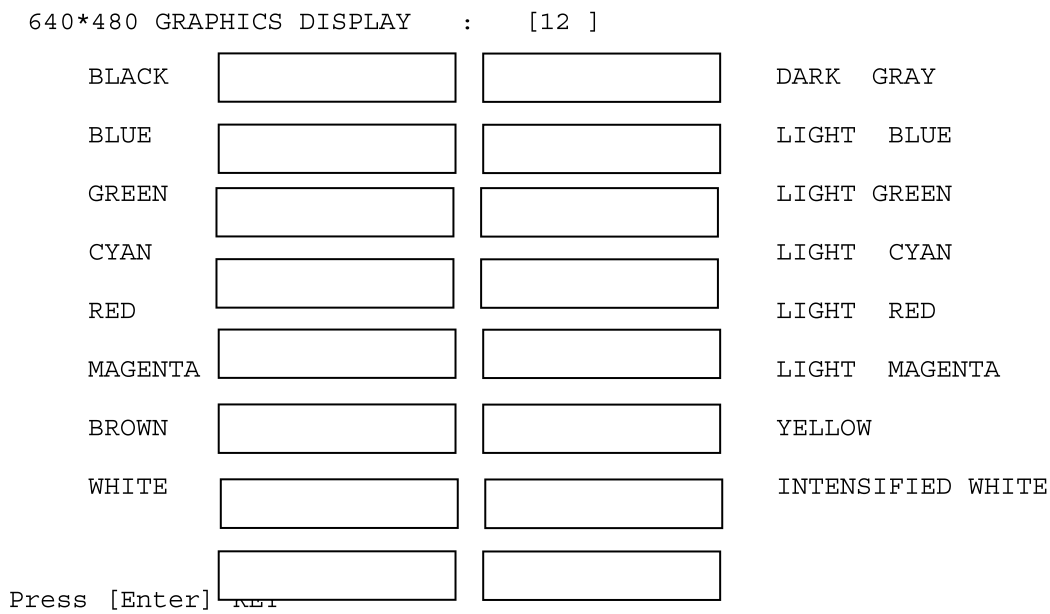
This subtest uses 640*350 video resolution to display 16 colors: black, blue, green, cyan, red, magenta, brown, white, dark gray, light blue, light green, light cyan, light red, light magenta, yellow, and intensified white. The screen below displays when this subtest is executed.

```
640*350 GRAPHICS DISPLAY   :   [10 ]

    BLACK                           DARK  GRAY
    BLUE                            LIGHT  BLUE
    GREEN                           LIGHT GREEN
    CYAN                            LIGHT  CYAN
    RED                             LIGHT  RED
    MAGENTA                         LIGHT  MAGENTA
    BROWN                           YELLOW
    WHITE                           INTENSIFIED WHITE

Press [Ente
```

Press **ENTER** to display the following 16 colors: black, blue, green, cyan, red, magenta, brown, white, dark gray, light blue, light green, light cyan, light red, light magenta, yellow, and intensified white using 640*480 video resolution.



To exit this subtest and return to the Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu.
Press **Ctrl** + **break** if **YES** was selected for *Test Loop* on the Test Parameter Menu.

Subtest 07 Display Page

This subtest displays video pages zero through seven.

```
 DISPLAY PAGE 0

000000000000000000000000000000000000000000000000000000000000000000000
..................................................................0
0..................................................................0
0..................................................................0
0..................................................................0
0..................................................................0
0..................................................................0
0..................................................................0
0..................................................................0
0..................................................................0
0..................................................................0
0..................................................................0
0..................................................................0
0..................................................................0
0..................................................................0
0..................................................................0
0..................................................................0
0..................................................................0
0..................................................................00
..................................................................0
000000000000000000000000000000000000000000000000000000000000000000000
```

To exit this subtest and return to the Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu.
Press **Ctrl** + **break** if **YES** was selected for *Test Loop* on the Test Parameter Menu.

Subtest 08 "H" Pattern Display

This subtest displays a full screen of "H" patterns.

```
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
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HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
```

To exit this subtest and return to the Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu. Press **Ctrl** + **break** if **YES** was selected for *Test Loop* on the Test Parameter Menu.

Subtest 9 Video DAC Register W/R/C

This subtest writes data patterns to the Video DAC register lookup table (PEL Address register), then reads the new data, and compares the result to the original data patterns. The original content of the Video DAC register is saved in RAM and restored after the test is completed.

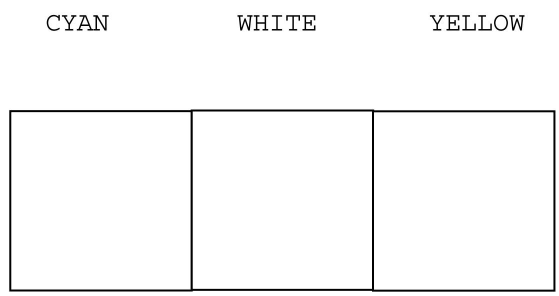
The test data patterns are 00H,15H, 2AH and 3FH.

> ***NOTE***: *If **NO** is selected for Test Loop on the Test Parameter menu, "Screen will remain blank" displays on the screen while the test is executing. When the test is complete the Display Test menu displays.*
>
> *If **YES** is selected for Test Loop on the Test Parameter menu, "The Screen will remain blank" displays on the screen and then the screen flickers due to the fast screen refresh while the test is executing. Press **Ctrl + break** to return to the Display Test menu.*

Subtest 10 Color Graphics Display

This subtest displays three colors, cyan, white and yellow on the screen as shown below.

```
640 * 480 GRAPHICS DISPLAY
```



To exit this subtest and return to the Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu.
Press **Ctrl** + **break** if **YES** was selected for *Test Loop* on the Test Parameter Menu.

Subtest 11 Color Attributes Display

This subtest displays 16 colors: black, blue, green, cyan, red, magenta, brown, white, dark gray, light blue, light green, light cyan, light red, light magenta, yellow, and intensified white. The screen below displays when this subtest is executed.

```
640*480 COLOR ATTRIBUTE DISPLAY
```

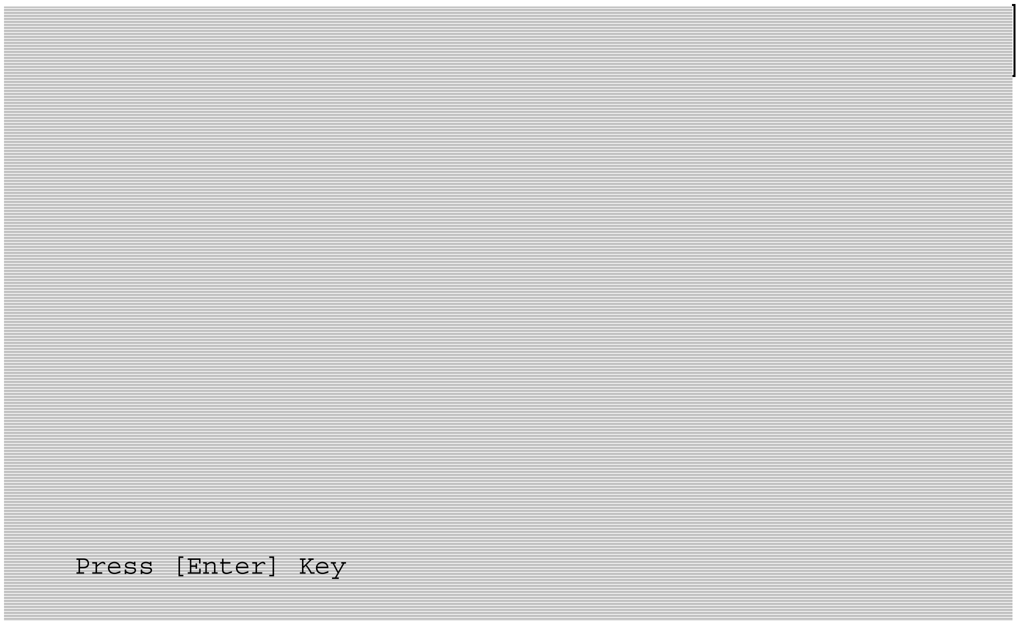
0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F

```
Press [Enter] Key
```

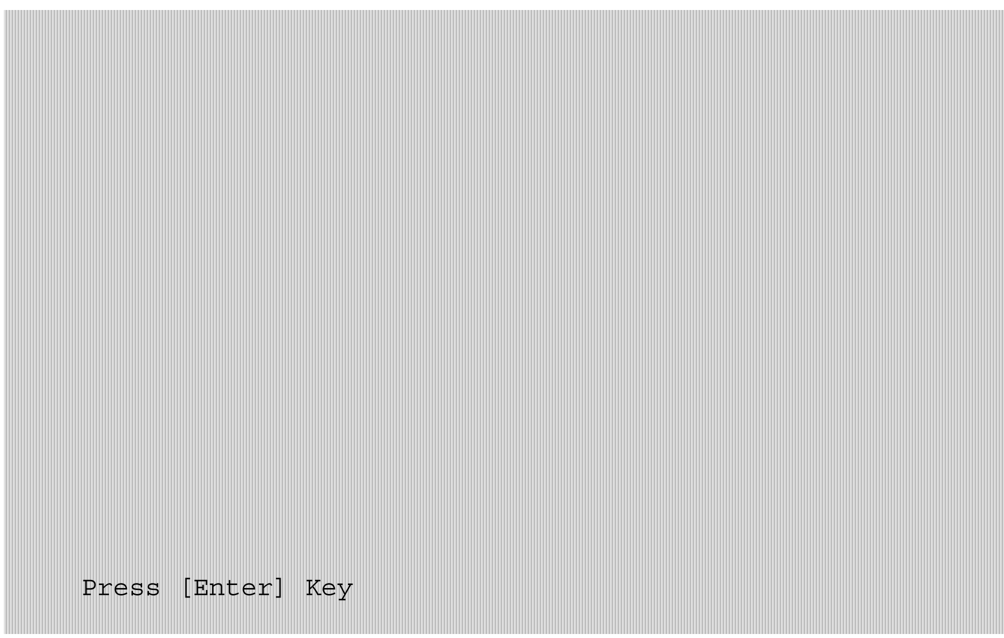
Pressing **Enter** executes VRAM mapping test which indicates vertical lines

Press **Enter** to execute the VRAM mapping test which displays a horizontal line at one dot intervals using Mode 12.

> ***NOTE:*** *The following screen does not display correctly. It will be amended in the next version.*



Press **Enter** to execute the VRAM mapping test which displays a vertical line at four dot intervals using Mode 12.



Press **Enter** to display VRAM mapping test using the all dots Mode.

```
Press [Enter] Key
```

To exit this subtest and return to the Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu.
Press **Ctrl** + **break** if **YES** was selected for *Test Loop* on the Test Parameter Menu.

Subtest 12 Color Tiling

This subtest displays black, gray, white, and 3 gradations of red, green, and blue as shown in the following display.

Black	Red	Green	Blue
Gray	Red Gradation	Green Gradation	Blue Gradation
White	Red Gradation	Green Gradation	Blue Gradation

To exit this subtest and return to the Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu. Press **Ctrl** + **break** if **YES** was selected for *Test Loop* on the Test Parameter Menu.

3.8 Floppy Disk Test

> ***CAUTION**: Before running the floppy disk test, prepare a formatted work disk. Remove the diagnostics disk and insert the work disk into the FDD. The contents of the floppy disk will be erased.*

To execute the Floppy Disk Test select 0**5** from the Diagnostic Test Menu, press **Enter** and follow the directions on the screen. The Floppy Disk Test contains five subtests that test the FDD. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01 Sequential Read

This subtest sequentially reads all the tracks (Tracks 0 to 79)on the floppy disk.

Subtest 02 Sequential W/R/C

This subtest continuously writes the data pattern B5ADADh to all the specified tracks selected in Subtest 01. The data pattern is then read and compared to the original data.

Subtest 03 Random Address/Data

This subtest writes random data to random addresses on all tracks defined in Subtest 01. The data is then read and compared to the original data.

Subtest 04 Write Specified Address

> ***NOTE****: The first two digits of the ADDRESS indicate which track is being tested, the next two digits indicates the head, and the last two digits indicate the sector.*

This subtest allows you to verify the errors from Subtest 02. It writes specified data to a specified track and head. Use the Log Utilities (see Section 3.21) to specify the track number and head number where the error(s) occurred during Subtest 02. The following message displays on the screen to enter the test data, track number, and head number.

```
TEST DATA  ??
TRACK NO (00~79) ??
HEAD NO (0~1) ?
```

Subtest 05 Read Specified Address

This subtest reads data from a specified track and head.

The following message displays on the screen to enter the test track number and head number.

```
TRACK NO (00~79) ??
HEAD NO (0~1) ?
```

3.9 Hard Disk Test

To execute the Hard Disk Test select **06** from the Diagnostic Test Menu, press **Enter** and follow the directions on the screen. The Hard Disk Test contains eight subtests that test the functions of the hard disk drive. Move the highlight bar to the subtest you want to execute and press **Enter**.

> ***NOTES****: The contents of the hard disk will be erased when subtest 02, 03, 04, 05, 07 or 08 is executed. Before running the test, transfer the contents of the hard disk to other disk.*
>
> *A password is necessary to execute the Hard Disk Test. The password is:* **hard disk**

Subtest 01 Sequential Read

This subtest sequentially reads all the tracks on the HDD starting at track 0. When all tracks have been read, the test starts at the maximum track and reads sequentially back to track 0.

Subtest 02 Address Uniqueness (This subtest need very long time)

This subtest writes unique address data to each sector of the HDD track-by-track. The data written to each sector is then read and compared with the original data. There are three ways the HDD can be read:

- Forward sequential
- Reverse sequential
- Random

Subtest 03 Random Address Data

This subtest writes random data to 1000 different random addresses on the HDD. This data is then read and compared to the original data.

Subtest 04 Cross Talk and Peak Shift

This subtest writes eight of the most likely to fail data patterns (shown below) to a cylinder on the HDD, then reads the data while moving from cylinder to cylinder.

Data Pattern
B5ADADH
4A5252H
EB6DB6H
149249H
63B63BH
9C49C4H
2DB6DBH
D24924H

Subtest 05 Write Specified Address

> ***NOTE:*** *This subtest is designed to run with the Test Loop set to* ***NO****. This subtest is a debug tool and the operator should enter the Test Parameters each time.*

.

This subtest allows you to verify the errors from Subtest 01. It writes specified data to a specified LBA. Use the Log Utilities (see Section 3.18) to specify the LBA number where the error(s) occurred during Subtest 01. The following message displays on the screen to enter the test data, and Sector count.

```
TEST DATA        ??
SECTOR COUNT (01~39) ??
START ADDRESS (00000000~MAX Address) ?
```

Subtest 06 Read Specified Address

> ***NOTE:*** *This subtest is designed to run with the Test Loop set to* ***NO****. This subtest is a debug tool and the operator should enter the Test Parameters each time.*

This subtest allows you to verify the errors from Subtest 01. It reads specified data (Subtest 06) from a specified LBA. Use the Log Utilities (see Section 3.18) to specify the LBA number where the error(s) occurred during Subtest 01. The following message displays on the screen to enter the test sector count.

```
SECTOR COUNT (01~39) ??
START ADDRESS (00000000~MAX Address) ?
```

Subtest 07 Sequential Write

This subtest writes specified data to all cylinders on the HDD. The following message displays on the screen to enter the test data.

```
TEST DATA  ????(=37b3H)
```

Subtest 08 W-R-C Specified Address

This subtest writes specified data to a specified sector count, then reads and compares the result. The following message displays on the screen to enter the test data, sector count.

```
TEST DATA   ????(=37b3H)
SECTOR COUNT (01~39) ??
START ADDRESS (00000000~Max Address) ?
```

3.10 Real Time Clock Test

To execute the Real Time Clock Test select **07** from the Diagnostic Test Menu, press **Enter** and follow the directions on the screen. The Real Time Clock Test contains three subtests that test the computer's real time functions. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01 Real Time

This subtest allows you to change the date and time. To execute the Real Time Subtest, follow these steps:

1. Select Subtest **01** and the following displays:

```
                    [ REAL TIME TEST  ]

Current date : mm-dd-yyyy

Current time : hh:mm:ss

Enter new date : mm-dd-yyyy

Enter new time : hh:mm:ss


Press [Enter] key to exit test
```

2. If the current date is not correct, enter the correct date at the "Enter new date" prompt and press **Enter**. The following prompt displays:

```
Enter new time :
```

3. If the current time is not correct, enter the correct time using a 24-hour format and press **Enter**.

> ***NOTE**: If **NO** is selected for Test Loop on the Test Parameter menu, the Real Time Clock Test menu displays.*
>
> *If **YES** is selected for Test Loop on the Test Parameter menu, the screen above displays and the test is executed again. Press **Ctrl + break** to return to the Real Time Clock Test menu.*

Subtest 02 Backup Memory

This subtest writes 50 bytes of test data (FFH, AAH, 55H, and 00H) to the CMOS 14th address, then reads the new data and compares it to the original data.

Subtest 03 Real Time Carry

> ***CAUTION**: When this subtest is executed, the current date and time are reset.*

This subtest checks the clock's carry function.

```
                    [ REAL TIME CARRY TEST  ]

   Current date : 12-31-1999

   Current time : 23:59:55

 Press [Enter] key to exit test
```

The following is the display after the date carry function is executed.

```
                    [ REAL TIME CARRY TEST  ]

   Current date : 01-01-2000

   Current time : 00:00:01

 Press [Enter] key to exit test
```

To exit this subtest and return to the Real Time Clock menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu.
Press **Ctrl** + **break** if **YES** was selected for *Test Loop* on the Test Parameter Menu.

3.11 Cache Memory Test

To execute the Cache Memory Test select **08** from the Diagnostic Test Menu, press **Enter** and follow the directions on the screen. The Cache Memory Test contains eight subtests that test the computer's cache memory. Move the highlight bar to the subtest you want to execute and press **Enter**.

> ***NOTE**: If **NO** is selected for Test Loop on the Test Parameter menu, the screen will remain blank while the subtest is executing. When the test is complete the Cache Memory Test menu displays.*
>
> *If **YES** is selected for Test Loop on the Test Parameter menu, the Test Status screen displays while the subtest is executing. Press **Ctrl + break** to return to the Cache Memory Test menu.*

Subtest 01 Constant Data Test

This subtest reads the contents of cache memory and saves it into RAM. The subtest then writes constant data (FFFFH, AAAAH, 5555H, 0101H, 0000H), reads the new data and compares the result with the original data pattern. The original cache memory content is then restored to the cache memory.

Subtest 02 Address Pattern Test

This subtest reads the contents of cache memory and saves it into RAM. The subtest then writes address data patterns (0000H, 0001H, 0002H, through 3FFDH, 3FFEH, 3FFFH), reads the new data and compares the result with the original data. The original cache memory content is then restored to the cache memory.

Subtest 03 Increment/Decrement Test

This subtest reads the contents of cache memory and saves it into RAM. The subtest then writes the increment data (00H, 01H, 02H, through FDH, FEH, FFH), reads the new data and compares the result with the original data. After comparing the incremental data, decrement data (FFH, FEH, FEH, through 02H, 01H, 00H) is written and the new data is read and compared with the original data. The original cache memory content is then restored to the cache memory.

Subtest 04 Bit Shift Pattern Test

This subtest reads the contents of cache memory and saves it into RAM. The subtest then writes the bit shift data patterns (1 bit shifted every 4 bytes), reads the new data and compares the result with the original data. The original cache memory content is then restored to the cache memory.

Subtest 05 Write Disturb Test (We can't support this time)

This subtest reads the contents of cache memory and saves it into RAM. The subtest then writes the "write disturb data," reads the new data and compares the result with the original data. The original cache memory content is then restored to the cache memory.

Subtest 06 Checker Board Test

This subtest reads the contents of cache memory and saves it into RAM. The subtest then writes the "checker board data," (data which is inverted front/back and left/right) reads the new data and compares the result with the original data. The original cache memory content is then restored to the cache memory.

Subtest 07 Marching Test

This subtest reads the contents of cache memory and saves it into RAM. The subtest then writes the "marching data," (00H through 01H and 01H through 00H) reads the new data and compares the result with the original data. The original cache memory content is then restored to the cache memory.

Subtest 08 Working Data Test

This subtest reads the contents of cache memory and saves it into RAM. The subtest then writes the "working data," reads the new data and compares the result with the original data. The original cache memory content is then restored to the cache memory.

3.12 High Resolution Display Test

To execute the High Resolution Display Test select **09** from the Diagnostic Test Menu, press **Enter** and follow the directions on the screen. The High Resolution Display Test contains six subtests that test the computer's high resolution video display. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01 VRAM W/R/C Test

This subtest writes address and data patterns to Video RAM, then reads the values from the Video RAM and compares them to the original test patterns. During the execution of this test 13 different color screens display: black, green, green, blue, blue, red, red, red, black, white, pink, cyan, and black.

Test Process:

1. Sets the video display to 1024*768 mode

2. Bank change test
   Writes 1 byte data in order 0, 1, through Fh, and compares the result, at every bank, to the original data patterns.

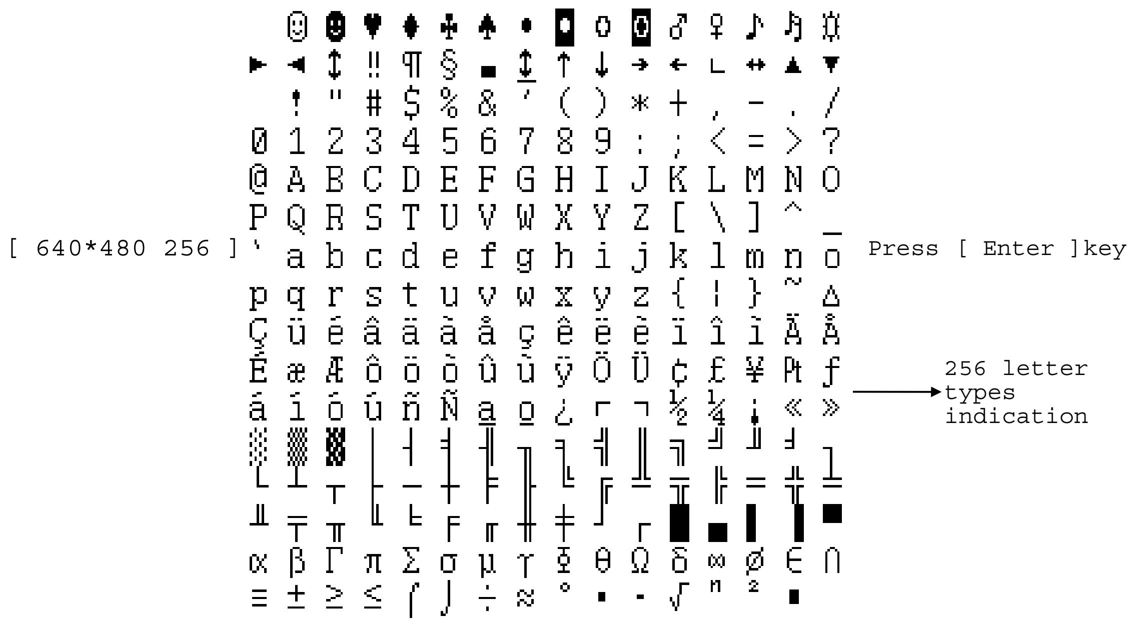
3. Bit shift data test
   Writes 01h data into addresses A000:0000h through A000:FFFFh for each bank, reads the new data and, then compares the results with the original data. Data is then shifted 1 bit to the left, and all bits (01h, 02h, 04h, 08h, through 80h) are tested again.

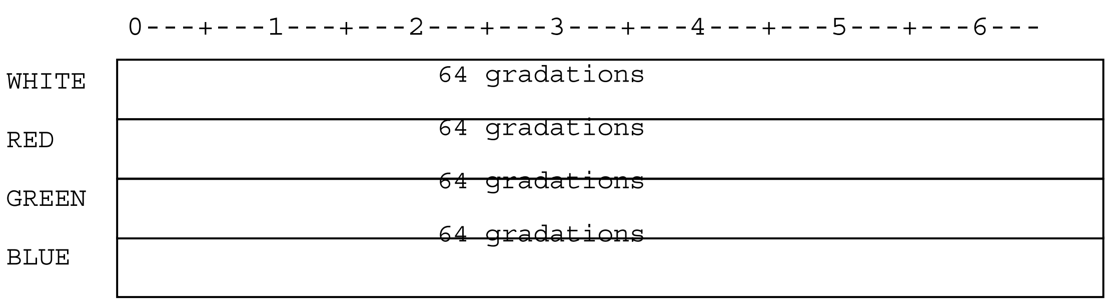
4. Fixed data test
   Writes test data (in order FFh, AAh, 55h, 00h) into addresses A000:0000h through A000:FFFFh for each bank by, reads the new data and, then compares the results with the original data. Data is then shifted 1 bit to the left, and all bits are tested again

> ***NOTE:*** *If **NO** is selected for Test Loop on the Test Parameter menu, the screen displays the colors listed above and then the High Resolution Display Test menu displays.*
>
> *If **YES** is selected for Test Loop on the Test Parameter menu, the screen displays the colors listed above. Press **Ctrl + break** to return to the High Resolution Display Test menu.*

Subtest 02 640*480 Mode Display

This subtest uses 640*480 video resolution to display a high resolution white frame, 256 letter types (8*16 pixels) and 64 gradations of white, red, green, and blue as shown below.



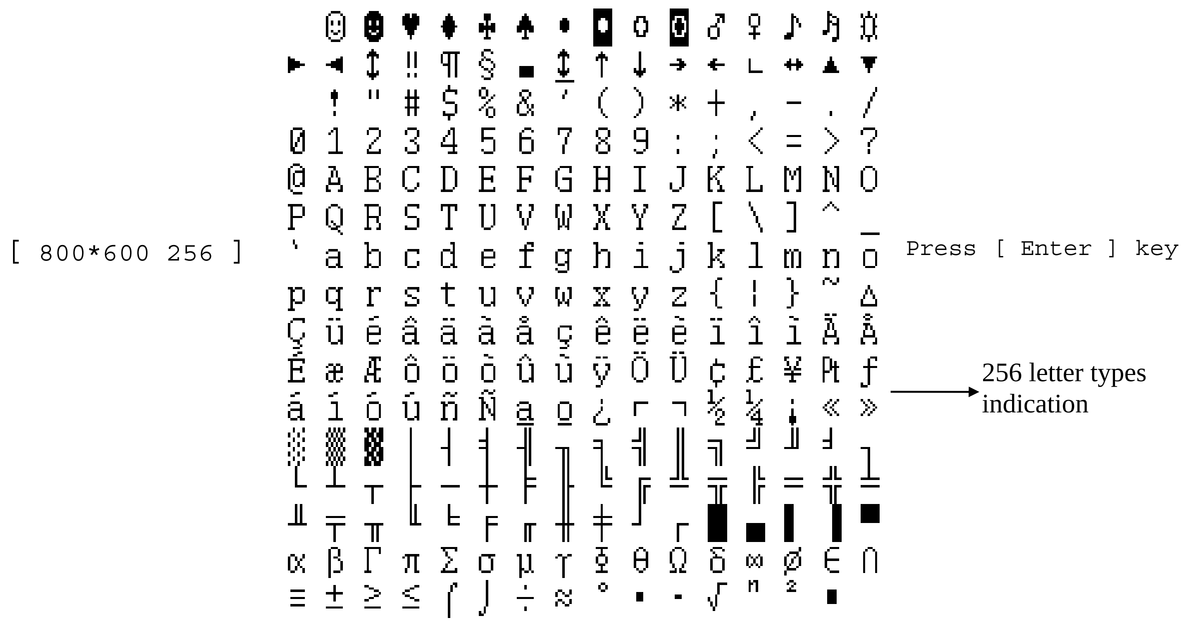


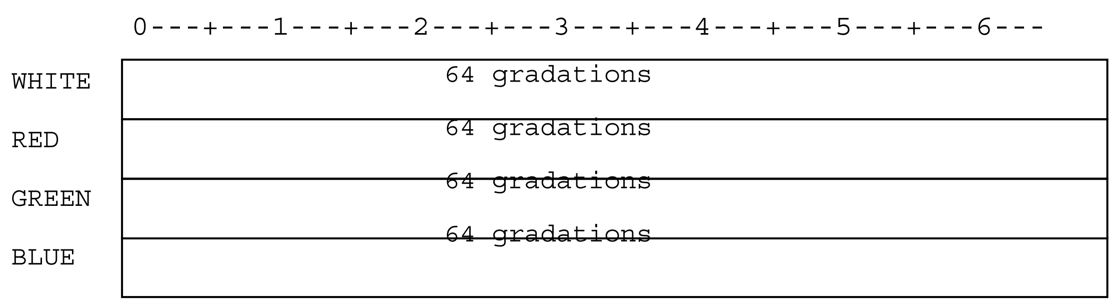
To exit this subtest and return to the High Resolution Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu. Press **Ctrl** + **break** if **YES** was selected for *Test Loop* on the Test Parameter Menu.

Subtest 03 800 * 600 Mode Display

This subtest uses 800*600 video resolution to display a high resolution white frame, 256 letter types (8*16 pixels) and 256 gradations of white, red, green, and blue as shown below.



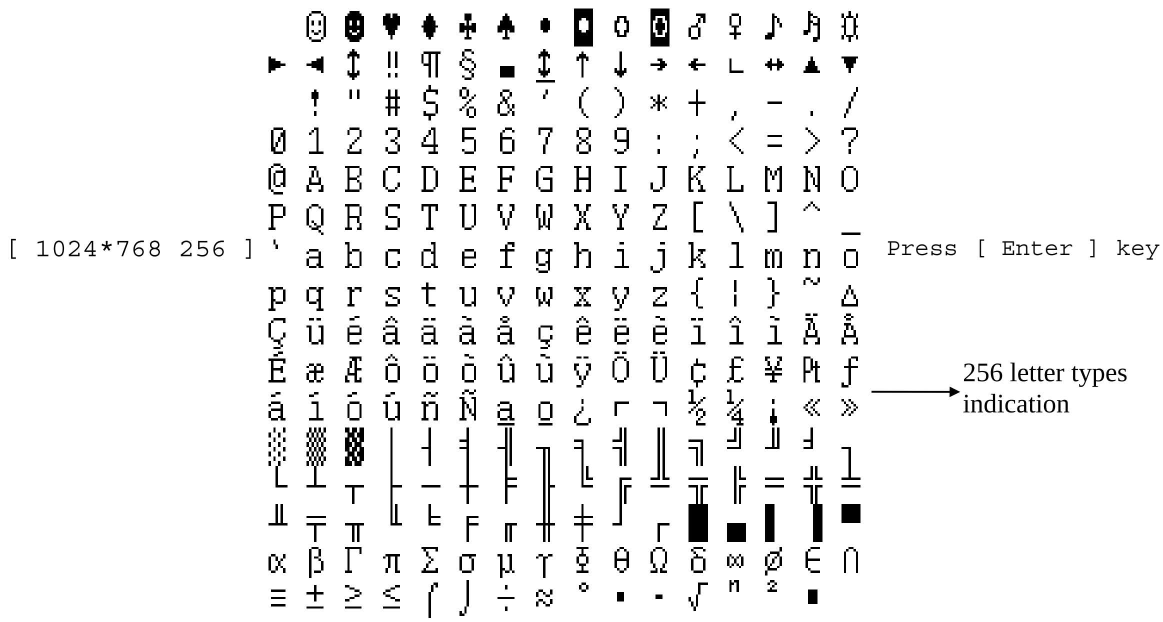


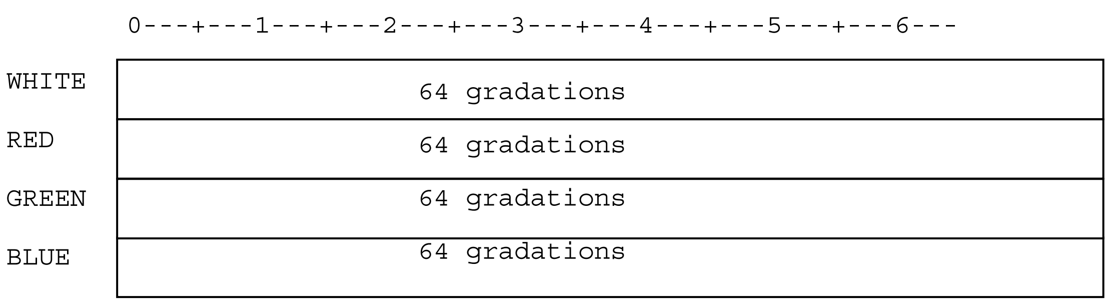
To exit this subtest and return to the High Resolution Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu.
Press **Ctrl** + **break** if **YES** was selected for *Test Loop* on the Test Parameter Menu

Subtest 04 1024* 768 Mode Display

This subtest uses 1024*768 video resolution to display a high resolution white frame, 256 letter types (8*16 pixels) and 64 gradations of white, red, green, and blue as shown below.





To exit this subtest and return to the High Resolution Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu. Press **Ctrl** + **break** if **YES** was selected for *Test Loop* on the Test Parameter Menu.

Subtest 05 “H” Pattern Display

This subtest uses the 1024*768 Mode to display a high resolution white frame, “H” letters (8*16 pixels fonts), at 128 letters by 48 lines.

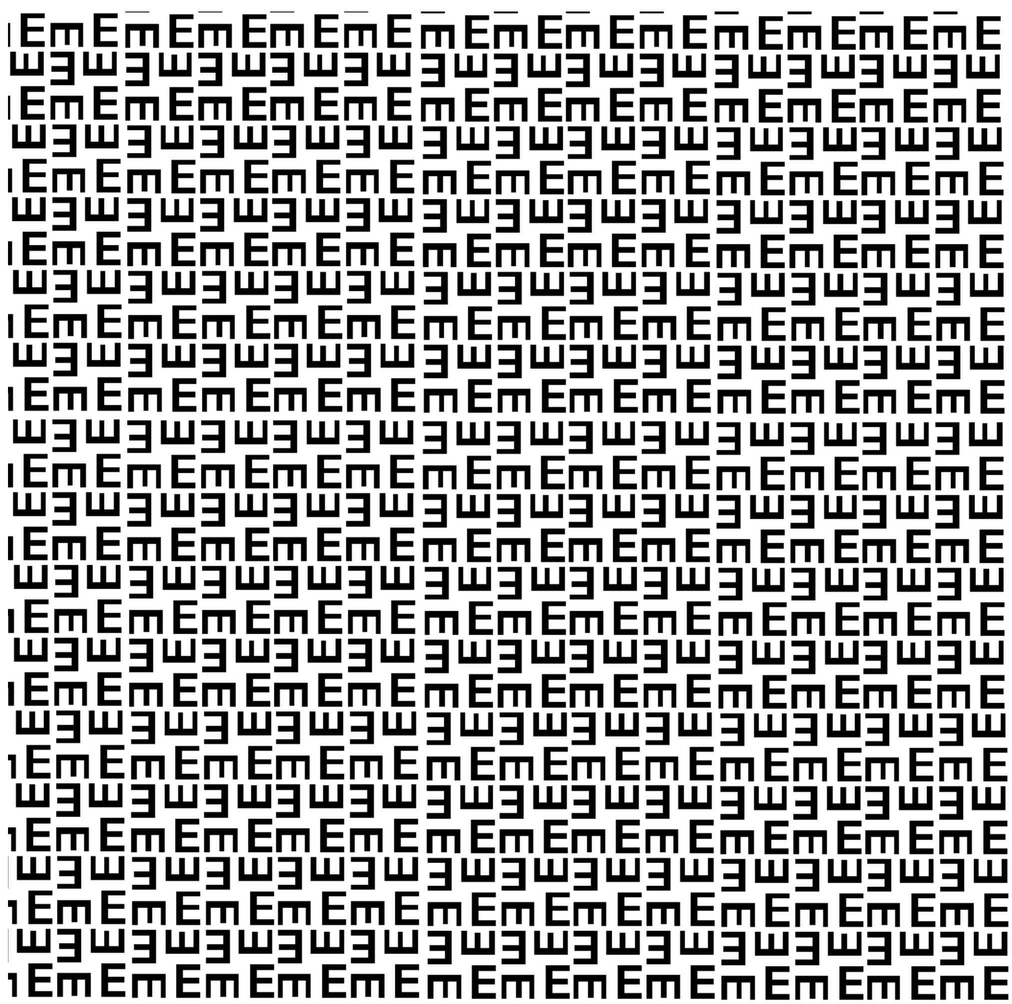
```
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
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HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
```

To exit this subtest and return to the High Resolution Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu.
Press **Ctrl** + **break** if **YES** was selected for *Test Loop* on the Test Parameter Menu.

Subtest 06 Focus Test (“E” Pattern)

This subtest sets the 1024*768 Mode and displays “E” patterns (18*18 dot fonts), at 56 letters *42 lines surrounded by a high resolution white frame.



To exit this subtest and return to the High Resolution Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu. Press **Ctrl** + **break** if **YES** was selected for *Test Loop* on the Test Parameter Menu.

3.13 Multimedia Test

To execute the Multimedia Test select **10** from the Diagnostic Test Menu, press **Enter** and follow the directions on the screen. The Multimedia Test contains four subtests that test the computer's multimedia functions. Move the highlight bar to the subtest you want to execute and press **Enter**.

> ***NOTE****: Use the Toshiba Backup CD-ROM for Subtests 01, 02, and 03.*

Subtest 01 Sequential Read Test

This subtest sequentially reads one block unit (2K bytes) of all logical addresses from the test CD.

> ***NOTE****: If* ***NO*** *is selected for Test Loop on the Test Parameter Menu, the screen will remain blank while the subtest is executing. When the test is complete the Multimedia Test menu displays.*
>
> *If* ***YES*** *is selected for Test Loop on the Test Parameter Menu, the Test Status screen displays while the subtest is executing. Press* ***Ctrl + break*** *to return to the Multimedia Test menu.*

Subtest 02 Random Read Test

This subtest randomly reads all addresses.

Subtest 03 Read Specified Address Test

This subtest reads data from a specified block of addresses.

The following message displays on the screen to enter the start and end block addresses:

```
START BLOCK ADDRESS ?
END BLOCK ADDRESS   ?
```

Subtest 04 1 Point W/R/C (R/RW Media)

> ***NOTE****: Use CD-R or CD-RW, the CD-ROM and DVD cannot be used for this subtest, and some DVD-dual can't support this test.*

This subtest writes specified data to a specified block count, then reads and compares the result.

3.14 MEMORY2 Test

To execute the Expansion Test select **11** from the Diagnostic Test Menu, press **Enter** and follow the directions on the screen. The MEMORY2 Test contains four subtests that test the computer's. Move the highlight bar to the subtest you want to execute and press **Enter**.

> ***NOTE**: If **NO** is selected for Test Loop on the Test Parameter menu, the Test Status screen displays while the test is executing. When the test is complete the Memory Test menu displays.*
>
> *If **YES** is selected for Test Loop on the Test Parameter menu, the Test Status screen displays while the test is executing. Press **Ctrl + break** to return to the Memory Test menu*

Subtest 01 All one/All zero test

This subtest performs pseudorandom data read/write. The data consists of "all ones"/"all zero" patterns produced by pseudorandom sequence generator. The test checks address error.

```
FFFFFFFFFFFFFFFF0000000000000000
0000000000000000FFFFFFFFFFFFFFFF
```

Subtest 02 Walking 1/Walking 0 test (Left)

This subtest uses "running one"/"running zero" patterns. This test sequence allows also to checking system bus in maximum noise conditions. The following test sequence is written.

```
7FFF7FFF7FFF7FFF8000800080008000
BFFFBFFFBFFFBFFF4000400040004000
```

After all the memory being tested is filled with the pattern, it is read in descanting direction and compared with reference data. As the memory is read, the data is replaced with inverse test pattern. After all the memory is read and replaced with inverted pattern, it is read in descanting direction and compare with new reference data. As the memory is read, the data is replaced with next pattern, which is like first one shifted to right.

Subtest 03 Walking 1/Walking 0 test (Right)

Tee test method is the same as Subtest2. However, the data to be used differs.

```
80008000800080007FFF7FFF7FFF7FFF
4000400040004000BFFFBFFFBFFFBFFF
```

Subtest 04 Walking 1/Walking 0 test (Left/ Right)

Tee test method is the same as Subtest2. However, the data to be used differs.

```
7FFF7FFF7FFF7FFF8000800080008000
BFFFBFFFBFFFBFFF4000400040004000
DFFFDFFFDFFFDFFF2000200020002000


FFFBFFFBFFFBFFFB0004000400040004
FFFDFFFDFFFDFFFD0002000200020002
FFFEFFFEFFFEFFFE0001000100010001
80008000800080007FFF7FFF7FFF7FFF
4000400040004000BFFFBFFFBFFFBFFF


0004000400040004FFFBFFFBFFFBFFFB
0002000200020002FFFDFFFDFFFDFFFD
0001000100010001FFFEFFFEFFFEFFFE
```

3.15 Error Codes and Error Status Names

The following table lists the error codes and error status names for the Diagnostic Tests.

Table 3-2 Error codes and error status names (1/2)

Device Name	Error Code	Error Status Name
(Common)	FF	Data Compare Error
Memory	02	Protected Mode Not Changed
	??	Other Error
FDD	01	Bad Command Error
	02	Address Mark Not Found
	03	Write Protected
	04	Record Not Found
	06	Media Change Line Error
	08	DMA Overrun Error
	09	DMA Boundary Error
	0C	Select Media Error
	10	CRC Error
	20	FDC Error
	40	Seek Error
	80	Time Out Error
	??	Other Error
HDD	01	Bad Command Error
	02	Bad Address Mark Error
	04	Record Not Found
	05	HDC Not Reset Error
	07	Drive Not Initialized
	09	DMA Boundary Error
	0A	Bad Sector
	0B	Bad Track Error
	10	ECC Error
	11	ECC Recover Enabled
	20	HDC Error
	40	Seek Error
	80	Time Out Error
	AA	Drive Not Ready

Table 3-2 Error codes and error status names (2/2)

Device Name	Error Code	Error Status Name
HDD	BB	Undefined Error
	CC	Write Fault
	E0	Status Error
	F0	No Sense Error
	??	Other Error
Cache Memory	02	Protect Mode Error
	03	Caching Error
	??	Other Error
Multimedia	01	Write Error
	0F	Invalid Drive
	15	Drive Not Ready
	??	Other Error

NOTE: *If error status name is* **Other Error** *, please reference the* **Error Code** *for error information*

3.16 Running Test

***NOTES**:*

1. *You may add or delete subtests using the Running Test Edit Item function, see Section 3.20.*
2. *Do not forget to insert a work disk in the FDD. If a work disk is not inserted an error will be generated during the Floppy Disk Test.*
3. *If the test completes successfully an "PASS" sign with blue letters displays on the screen.*
4. *If the test fails or is interrupted before completion an "FAIL" sign with red letters displays on the screen.*
5. *If running item not select an "NOITEM" sign with green letters display on the screen.*
6. *All errors which occur during execution of the Running Test are logged in the Log File.*
7. *This program is executed according to the* Count Loop *number selected in the Running Test Edit Item, see Section 3.20. To terminate the program, press **Ctrl + Break.***

3.17 DMI INFOEMATION

Select **03** from the Diagnostics Menu and press **Enter** to Check or Write DMI Information Data:

3.17.1 Check DMI Information

The Check DMI Configuration program contains the following configuration information for the computer:

> ***NOTE:*** *Please set the media of DVD before starting a test.*

System information (Type 1)

1. Manufacture : TOSHIBA
2. Product Name : Satellite XXXXXX
3. Version :(TOSHIBA Part Number)
4. Serial Number : Serial Number
5. UUID Number: xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

OEM Strings (Type 11)

1. OEM String : xxxxxxxxxxxxxxxxxxxxxxxxxxxxx

On Board LAN MAC

1. MAC ADR : xxxxxxxxxxxx

DVD Region Code

1. User Change Time : X
2. Region Code : X

3.17.2 Write DMI Information

The Write DMI Information program contains the following information for the computer :

1. Manufacture Name (TOSHIBA)
2. Product Name (Satellite XXXXXX)
3. Part Number (PSL20X-XXXXXX)
4. Serial Number (12345678W)
5. OEM String (PSL20X-XXXXX,SXXXXXXXXXX)
6. Model Select [1]Dyn-Jpn [2]Tos-Jpn [3]Tos-Eng [4]Tos-FR
7. Write UUID (XXXXXXXXXXXXXXXX)
8. Brightness Write (XXXXXXXX)

9. Project Identifier [1]LCD13"[2]LCD14"[3]LCD15"[4]LCD17"
a. SLP2.0 Build Sig [1]Non OS [2]OS
b. Wireless LAN ID (001E4CXXXXXX)

Select 1 ~ b to keyin new data , select 0 to exit program , program will compare input data length with the max length , if over will retry keyin

Note : Please Check New DMI Information After System Restart !! V2.6

1. **** Manufacture Name (TOSHIBA) - (15)
2. **** Product Name (Satellite XXXXXX) - (31)
3. **** Part Number (PSL20X-XXXXXX) - (15)
4. **** Serial Number (12345678W) - (9)
5. **** OEM String (PSL20X-XXXXX,SXXXXXXXXXX) - (31)
6. **** Model Select [1]Dyn-Jpn [2]Tos-Jpn [3]Tos-Eng [4]Tos-FR – (2)
7. **** Write UUID (XXXXXXXXXXXXXXXX) – (16)
8. **** Brightness Write (XXXXXXXX) – (8)
9. **** Project Identifier [1]LCD13"[2]LCD14"[3]LCD15"[4]LCD17"-(1)
a. **** SLP2.0 Build Sig [1]Non OS [2]OS-(2)
b. **** Wireless LAN ID (001E4CXXXXXX) –(6)
0. **** Exit
Please Select (1 ~ b) To Modify DMI String :

Current Data of EEPROM : Toshiba
1. Enter the Manufacture Name : TOSHIBA
Your Keyin is : TOSHIBA …… This is your keyin data
EEPROM return : TOSHIBA ……. This is read from eeprom back

Press any key to continue
Note : Please Check New DMI Information After System Restart !!

If Keyin length too long will retry :

Current Data of EEPROM : 12345678W
4. Enter the Serial Number : 12345678901234
Your Keyin String Length Not Correct 14 > 9 !!!

Current Data of EEPROM : 12345678W
4. Enter the Serial Number :

NOTE: *The SLP2.0 is Microsoft SPEC , call "System Locked Pre-Installation"or"SLP",*

It is for OEM pre install Windows and no need to Active , If you select Non OS , then you need to Active your OS before you use .

3.17.3 Computrace Disabled

The Write Computrace Information to disabled computrace function before ship :

The information as below :

dmiStorageBase = df010h
dmiStorageSize = 841h
NVR 72h/0ah
*** Setting SMBIOS data! ***
Type 11 base 26h
UUID = "e0f43ec347f4db118688001b24f463c5"
Type 12 DSN: Serial Number: "   Y7KFT037T"
Type 12 DSN: Serial Number: "00000590"
Type 12 DSN: Serial Number: "SANYO002A2007/12/14"
*** Setting SMBIOS data! ***
Type 11 Length: 5 Handle : 0009h
String 1: "PSU400-123321,S123456789   ", 0
String 2: "XQMG1hLoEhYLF", 0
String 3: "GKpncOhAIONam", 0
String 4: "Z87E-Kr8+kIg8", 0, 0
*** Disabled! ***

Press Any Key To Return!

3.18 Log Utilities

This function logs error information generated while a test is in progress and stores the results in RAM (Maximum error log : 500 times). This function can store data on a floppy disk. If the power switch is turned off, the error information will be lost. Error information is displayed in the following order:

1. Error count (CNT)
2. Test name and subtest number (TEST)
3. Pass count (PASS)
4. Error status (STS)
5. FDD/HDD or memory address (ADDR)
6. Write data (WD)
7. Read data (RD)
8. Error Name (ERROR NAME/DETAILS)

3.18.1 Operations

1. Select **04** and press **Enter** in the Diagnostics Menu to log error information into RAM or onto a floppy disk. Error information is displayed in the following format:

```
                 XXXX ERRORS         PASSCOUNT = XXXX

CNT   TEST      PASS   STS   ADDR      WD   RD   ERROR NAME/DETAILS
001   FDD 02    0000   180   0000001   00   00   WRITE PROTECTED
002   FDD 01    0000   120   0000001   00   00   TIME OUT ERROR
 |     |    |    |      |      |        |    |          |
 |     |    |    |      |     Address   |    |          |
 |     |    |    |     Error Status     |    |          |
 |     |    |   Pass Count              |    |          |
 |     |   Subtest Number               |   Read Data   |
 |    Test Name                        Write Data       |
Error Count                                         Error Name and Detail
[[1:Next, 2:Prev, 3:Exit, 4;Clear, 5:FD Log Read, 6:FD Log Write, 7:Log Save]]
```

2. Error information displayed on the screen can be manipulated with the following number keys:

   The **1** key scrolls the display to the next page.
   The **2** key scrolls the display to the previous page.
   The **3** key returns to the Diagnostics Menu.
   The **4** key erases all error log information in RAM.
   The **5** key reads the log information from a floppy disk.
   The **6** key writes the log information to a floppy disk.
   The **7** key save the log information to a floppy disk.

The following are the test abbreviations for each Diagnostics Test.

Test Name	**Test Abbreviations**
System Test	ROM
Memory Test	RAM
Keyboard Test	KBD
Display Test	CRT
Floppy Disk Test	FDD
Hard Disk Test	HDD
Real Time Clock Test	RTM
Cache Memory Test	CAH
Height Resolution Display Test	KIF
Multimedia Test	MLT
Memory2 Test	RAM

3.19 System Configuration

Select **05** from the Diagnostics Menu and press **Enter** to display the following system configuration:

```
  SYSTEM CONFIGURATION :

     * - BIOS VER = VX.XX  KBC VER = XXXX
     * - MAC ADDRESS : XXXXXXXXXXXX
     * - 0 ASYNC ADAPTER
     * - 1 HDD DRIVE(S):XXXXXXXXXXXXXXXXXXXXXXXXXX
              FW Rev.:XXXXXXXX
              CUR LBA:XXXXXXXX  ORG LBA:XXXXXXXX
     * - BATTERY TYPE:XXXXXXXXXX
     * - XXXMB MEMORY SIZE
     * - XXX CPU
     * - 1 Vedio Chip XXXXXXXXXXXXX
     * - 1 ODD DRIVE(S):XXXXXXXX
                 FW Rev.:XXXX
```

Press **Enter** to return to the Diagnostics Menu.

3.20 Running Test Edit Item

3.20.1 Function Description

Function description lets you add or delete the subtests used to execute the Running Test. The following screen displays after pressing the **Tab** key to edit an item in the Running Test.

```
KEY OPERATION

↓      Cursor Down
↑      Cursor Up
PgDn   Page Down
PgUp   Page Up
Home   Top of ITEM
End    End of ITEM
Ins    Insert ITEM
Del    Delete ITEM
Enter  End
```

3.20.2 Operation Description

Select **05** from the Diagnostics Menu and press **Enter** to display the following:

```
                           Test Item Editor               [RUNNING TEST]

Loop Count (1-65535, 0 = infinity) [00000]           Error Stop  [ NO ]

T-No      Test Name              S-No         Subtest Name
01        System Test            Subtest 01   ROM Checksum
02        Memory Test            Subtest 01   Conventional Memory
02        Memory Test            Subtest 02   Protect Mode
02        Memory Test            Subtest 03   Protect Mode (32MB Max)
02        Memory Test            Subtest 04   RAM Refresh
04        Display Test           Subtest 01   VRAM W/R/C
04        Display Test           Subtest 02   Character Attribute Set
04        Display Test           Subtest 03   Character Set
04        Display Test           Subtest 04   80 * 25 Character Display
04        Display Test           Subtest 05   320 * 200 Graphics Display
04        Display Test           Subtest 06   640 * 200 Graphics Display
04        Display Test           Subtest 07   640 * 480 Graphics Display
04        Display Test           Subtest 08   Display Page
05        Floppy Disk Test       Subtest 02   Sequential W/R/C
08        Hard Disk Test         Subtest 01   Sequential Read
08        Real Time Clock Test   Subtest 02   Backup Memory Test

                         Tab: HELP (Key Operation)
```

1. Enter a **number** or **0** for **Loop Count** and press **Enter**.

Select a number from 1 to 65535 to define the number of times the Running Test executes.
Select 0 to run the test continuously until halted by the user.

2. Select the **NO** or **YES** for **Error Stop** and press **Enter**.

   Select **NO** to keep the test running even if an error is found.
   Select **YES** to stop the test program when an error is found.

   > ***NOTE:*** *All errors which occur during execution of the Running Test are logged in the Log File.*

3. Press **Insert** to add a subtest.

4. Press **Delete** to remove the selected subtest.

5. Press **Enter** when you have finished editing the Running Test list.

6. The following message displays:

```
Do you want to save the data?

   Save to disk
   Do not save
```

7. Select the option and press **Enter**.

8. Select **03** from the Diagnostics Menu and press **Enter** to execute the Running Test.

   > ***NOTE:*** *If press **Ctrl+break** in the runin process, please press more one any key to exit.*

3.21 Common Tests and Operation

3.21.1 How to operate a window

To input parameters, or open a window use the following keys.

↑ ↓ → ← key	: to move a highlight bar
[Enter] key	: to select an item at the highlight bar
[Esc] key	: to close the current window and go back to the previous window

3.21.2 How to Stop the Test Program

To stop a test:

[**Ctrl**]+[**Break**] Press the Ctrl key and the Break key simultaneously.

3.21.3 Test Status Screen

> ***NOTE****: The Test Status Screen does not display during all the tests. See the specific test description Sections 3.4 through 3.14.*

The following Test Status screen displays during most tests. See the description of each test Sections 3.4 through 3.14 for specific screen information.

```
      Test Name

Sub Test     :0101
Pass Count   :00000      Error Count   :00000
Write Data   :00         Read Data     :00
Address      :00000000   Status        :00
```

Test Name — Displays the name of the test being executed.

Subtest No. — Displays the Subtest number in the following format:

ffgg
ff = Subtest No.
gg = Step Number (Will be blank if the test does not have a Step Number.)

Pass Count	Displays the number of times the test has been executed.
Error Count	Displays the number of errors which have occurred during the test.
Write Data	Displays only the test data that has failed to compare during the test while being written during the test.
Read Data	Displays test data that has failed to compare during the test while being read during the test.
Test Address	Displays the Test Address. (The format differs for each test.)
Error Status	Displays the error status.
Error Name	Displays the name of the error.

3.21.4 Test Stop Display

If an error occurs during a Subtest and YES is selected for Error Stop, the following message displays:

```
[HALT OPERATION]

    1.Test end
    2.Continue
    3.Retry
```

* Select 1, 2, or 3

The three selections have the following functions:
1: Terminates the test program and exits to the subtest menu.
2: Continues the test from the error.
3: Restarts the test from the beginning.

Use the arrow keys to move the cursor to the desired option and press Enter.

3.21.5 How to enter data

Letters which must be entered are always shown in [ ]. Simultaneous entries are displayed by a "+" mark. For example:

[a] [Enter]
Press the "a" key, then press the [Enter] key.

[Ctrl] + [c]
Press the [Ctrl] key and the "c" key simultaneously.

Chapter 4

Replacement Procedures

Chapter 4 Contents

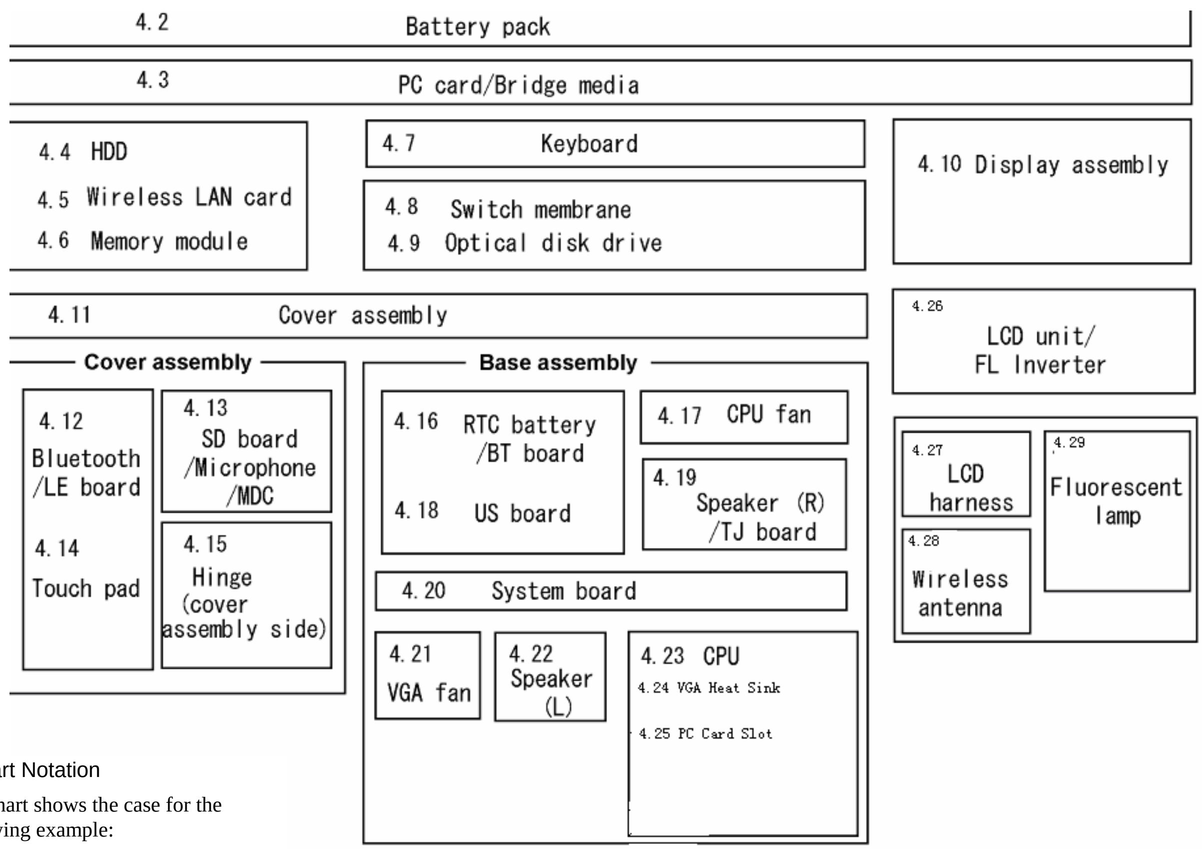
Figures

4.1 Overview

This chapter describes the procedure for removing and replacing the field replaceable units (FRUs) in the PC. It may not be necessary to remove all the FRUs in order to replace one. The chart below provides a guide as to which other FRUs must be removed before a particular FRU can be removed. The numbers in the chart indicate the relevant section numbers in this manual.

In all cases when removing an FRU, the battery pack must also be removed. When repairing an FRU that is the potential cause of a computer fault, use the chart to determine the order in which FRUs need to be removed.

The tilt stand, if it is installed, can be removed without any other FRUs removed.



- Chart Notation

The chart shows the case for the following example:

- Removing a MDC

All FRUs down to the “4.2 Battery pack” to “4.11 Cover assembly” above a SD board/Microphone/MDC must be removed.

Safety Precautions

Please read the following safety instructions before disassembling the computer and always follow the instructions while working on the computer.

DANGER:

1. *In the case of the battery, always use authentic parts or equivalent parts approved by Toshiba. Other batteries may have different specifications that are incompatible with the computer and may result in fire or explosion.*
   Due to the risk of alkali fluid leaks, never attempt to heat or disassemble the battery. Similarly, due to the risk of explosion, never expose the battery to flame.
2. *Some parts including the power supply and FL inverter generate high voltages. If you need to turn on the power while disassembling the computer, do not touch any connectors or other components due to the risk of electric shock. Also, do not disassemble individual parts when performing routine maintenance.*

WARNING:

1. *To prevent electric shock, turn off the power unplug the AC adapter from the power source.*
2. *As the battery installed to the computer is typically already charged, the risk of electric shock remains even when the AC adapter is unplugged from the socket. To prevent electric shock, always take off any metal jewelry or accessories such as necklaces, bracelets or rings before working on the computer. Never work with wet or moist hands.*
3. *Take care not to injury yourself on any edges or corners.*

CAUTION:

1. *Confirm that replacement parts have compatible specifications before replacing on the computer. Never use incorrect parts as these may cause faults on the computer.*
2. *To prevent internal damage such as short circuits or burning, do not allow any screws, paper clips, or other metal objects to fall into the computer. When removing screws, always replace with the same size screws. Ensure that all screws are fully tightened. Loose screws may result in short circuits leading to overheating, smoke or flame.*
3. *To prevent electric shock, check that you have disconnected all cables from a part before removing the part.*
4. *When connecting to the AC power supply, use only an AC adapter and cable approved by Toshiba.*
5. *To prevent electric shock, ensure that all replacement parts are compatible with the computer and that all cables and connectors are securely connected.*

Before You Begin

Take note of the following points before starting work. Always remove the AC adapter and battery pack before commencing any of the procedures. The procedure for removing the battery pack is described in section “4.2.1 Battery Pack”.

1. Do not disassemble the computer unless it is operating abnormally.
2. Use the designated tools.
3. Ensure that the environment for working on and storing parts does not contain any of the following.
    - Dust or dirt
    - Static electricity
    - Extremely hot, cold or humid conditions
4. Perform the diagnostic tests described in Chapter 2 to determine which FRU is the cause of the fault.
5. Do not perform any unnecessary work. Always work in accordance with the disassembly and reassembly procedures in this manual.
6. Keep parts removed from the computer in a safe place away from the computer where they will not be damaged or interfere with your work.
7. Disassembling requires the removal of a large number of screws. Keep removed screws in a safe place such that you can determine which screws belong to which part.
8. When reassembling, ensure that you use the correct screws and fit parts in the correct position. Screw sizes are noted in the text and figures.
9. As all parts have sharp edges and corners, take care not to cut yourself.
10. After replacing an FRU, check that the computer and replaced part operate correctly.

Disassembly Procedure

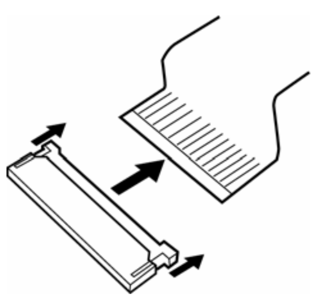
Three main types of cable connector are used.

- Pressure plate connector
- Spring connector
- Normal pin connector

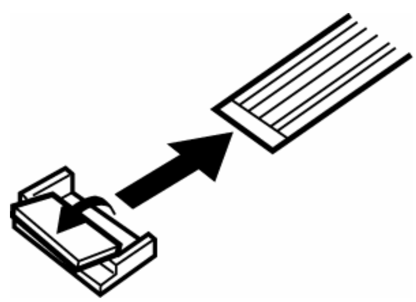
When disconnecting a pressure plate connector, lift up the tag on one side of the plastic pressure plate on the connector and pull the cable out from the connector. When reconnecting a cable to a pressure plate connector, lift up the pressure plate to a suitable height and insert the cable into the connector. Press down on both sides of the pressure plate such that both sides of the plate and connector are at the same height and that the cable is fixed in the correct position. Pull the cable to ensure that it is securely connected. If the cable is disconnected from the connector, reconnect it making sure that you lift the pressure plate high enough to insert fully the cable.

For spring connectors, lifting up the stopper frees the cable and allows it to be pulled out. To reconnect, hold the stopper in the up position and insert the cable, then lower the stopper to secure the cable.

Normal pin connectors are used for all other cables. Simply pull out or push in these connectors to disconnect or reconnect.



Pressure plate connector



Spring connector

Assembly Procedure

After the computer has been disassembled and the part that caused the fault has been repaired or replaced, the computer must be reassembled.

Take note of the following general points when assembling the computer.

- Take your time and follow the instructions carefully. Hurrying the assembly work will only introduce new problems.
- Check that all cables and connectors are securely connected.
- Before fastening FRUs or other parts in place, ensure that no cables are caught on screws or the FRU.
- Check that all latches are securely closed.
- Ensure that you have installed all FRUs correctly and do not have any screws left over. Using an incorrect screw may damage the thread or screw head and result in the FRU not being securely fastened in place.

After installing FRUs, check that the computer operates correctly.

Tools and Equipment

For your safety and the safety of the people around you, it is important that you use Electrostatic Discharge (ESD) equipment. Correctly utilizing of the equipment increases the percentage of successful repairs and saves on the cost of damaged or destroyed parts. The following equipment is required for disassembly and assembly.

- One Philips screwdriver with type 0 bit (for THIN HEAD screws)
- One Philips screwdriver with type 1 bit (for screws other than above)
- Tweezers (for lifting screws)
- ESD mats (lay on work table or floor)
- An ESD wrist strap and heel grounder
- Anti-static carpet or flooring

Screw Tightening Torque

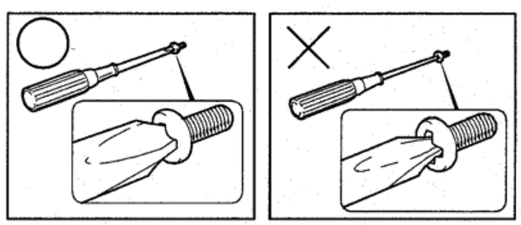
Use the following torque when tightening screws.

***CAUTION**: Overtightening may damage screws or parts. Undertightening may allow screws to loosen (and possibly fall out) causing a short circuit or other damage.*

***NOTE**: To tighten screws quickly and accurately, an electric screwdriver is recommended.*

- M2 (2mm) 0.167 N·m (1.7 kgf·cm)
- M2.5 (2.5mm) 0.245 N·m(2.5 kgf·cm)
- M2.5 (2.5mm) 0.392 N·m(4.0 kgf·cm) for Hinge support
- M3.0 (3mm) 0.245 N•m (2.5 kgf•cm)

***NOTE:** To prevent damage to THIN HEAD screws, press along the axis of the screwdriver while turning the screw. This is because the contact area between the screw and driver is less than for a pan head screw (standard pan-shaped screw head).*



Grip Color

Some screws have a colored grip area to help you determine the length of the screw.

- Even numbered length screws: Brown
- Odd numbered length screws: White
- Special length screw: Blue



"Special length screw" means screws whose length is indicated in an integral number to the first decimal places such as 2.5 mm, 2.8 mm and so on.

Screw Notation

To make maintenance of the computer easier, markings of the kinds of the screws including the types and lengths are indicated on the computer body.

Format:

Screw shape + Screw length (mm)

Screw shape

B: Bind screw
F: Thin head screw
S: Super thin head screw
T: Tapping screw
U: Other screws (Unique screws: pan head, stud, etc.)

Example: B6 … 6mm bind screw

4.2 Battery pack

Removing the battery pack

The following describes the procedure for removing the battery pack (See Figure 4-1).

> ***CAUTION:*** *Take care not to short circuit the terminals when removing the battery pack. Similarly, do not drop, knock, scratch, disassemble, twist, or bend the battery pack.*

1. Turn off the power of the computer.
2. Disconnect the AC adapter and all external devices from the computer.
3. Turn the computer upside down.
4. Slide and hold the battery release latch (2) to free the battery pack after moving the battery release lock (1) into it unlock position – pick the battery pack out of the computer from fillister.

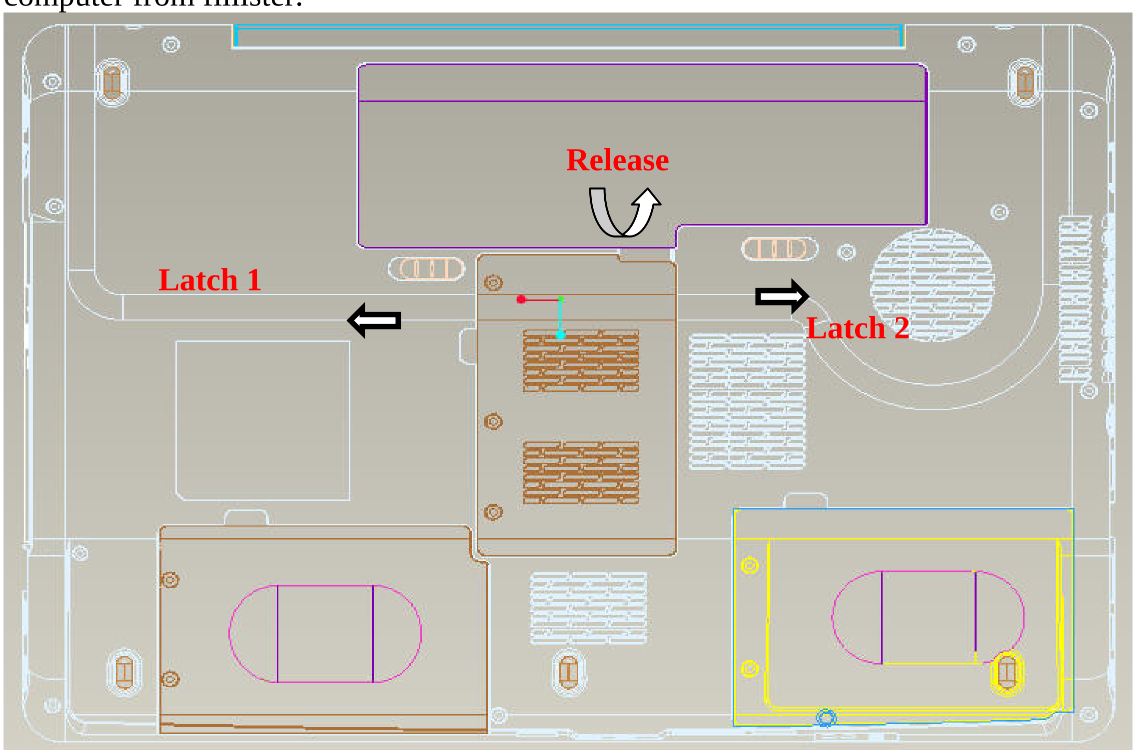


Figure 4-1 Remove the battery pack

NOTE: *Dispose of the used battery pack in accordance with the laws and ordinances of your local authority.*

Installing the battery pack

The following describes the procedure for installing the battery pack (See Figure 4-1).

CAUTION: *There is a danger that the lithium ion battery pack may explode if not fitted, operated, handled, or disposed correctly. Dispose always the used battery pack in accordance with the laws and ordinances of your local authority. Use only the batteries approved by Toshiba.*

NOTE: *Check visually the battery terminals and clean off any dirt with a dry cloth.*

1. Turn off the power of the computer.
2. Disconnect the AC adapter and all external devices from the computer.
3. Attach the **battery cover** to the **battery pack**.
4. Insert the battery pack
5. Ensure the battery release lock (1) is moved into its locked position

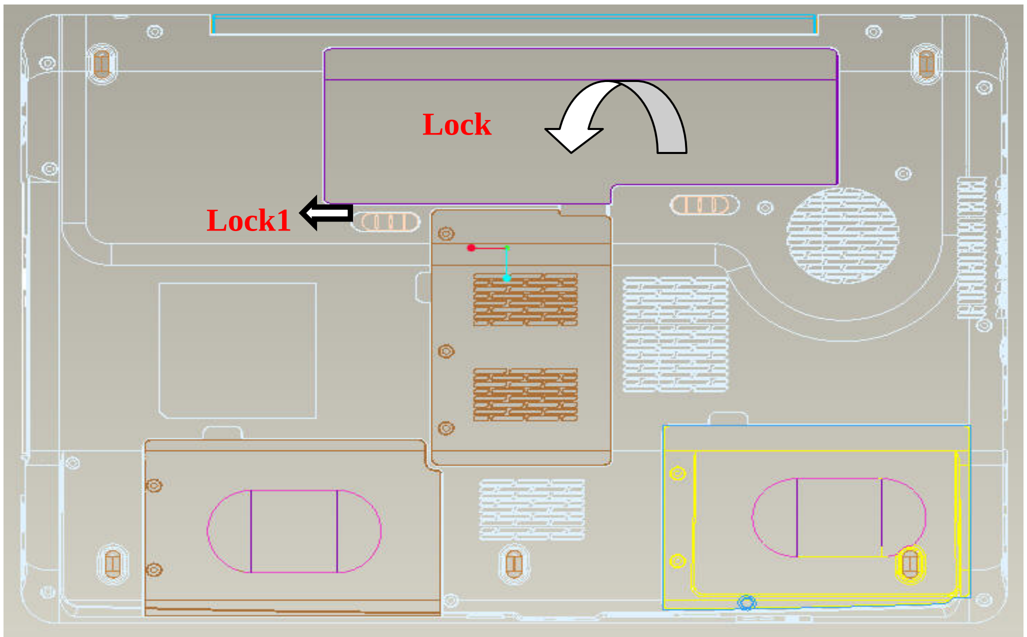


Figure 4-2-1 Install the battery pack

4.3 PC card

Removing a PC card

The following describes the procedure for removing a PC card (See Figure 4-2-1).

> ***CAUTION:*** *Insert or remove a PC card in accordance with any instructions in a PC card manual or the manuals of the computer system you are using.*

1. Push the **PC card**. It will pop out PCMCIA Card when you release it. And NEW Card same as PC card. Then press the card once more to eject a card.

2. Grasp one of **PC card** and remove it.

> ***NOTE****:* *If a PC card is not inserted all the way, the eject button may not pop out. Be sure to push a PC card firmly and press the eject button again.*

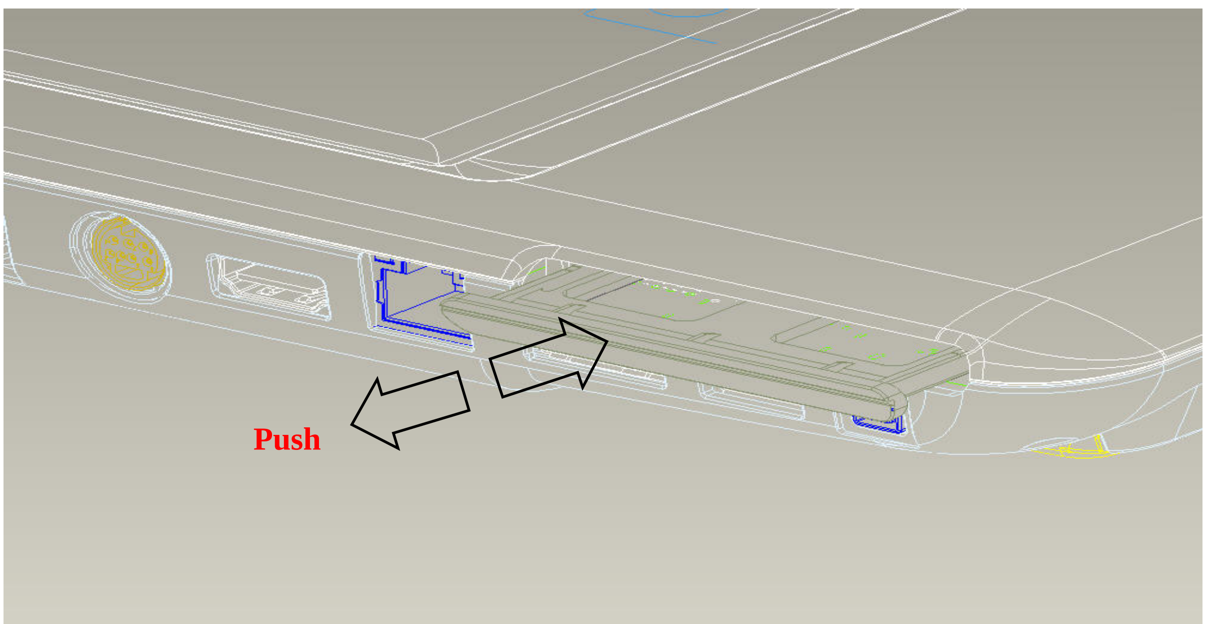


Figure 4-2 Remove a PC card

Installing a PC card

The following describes the procedure for inserting a PC card (See Figure 4-2-2).

1. Make sure the **PC card** does not stick out.
2. Insert a **PC card** and press it until it is securely connected.

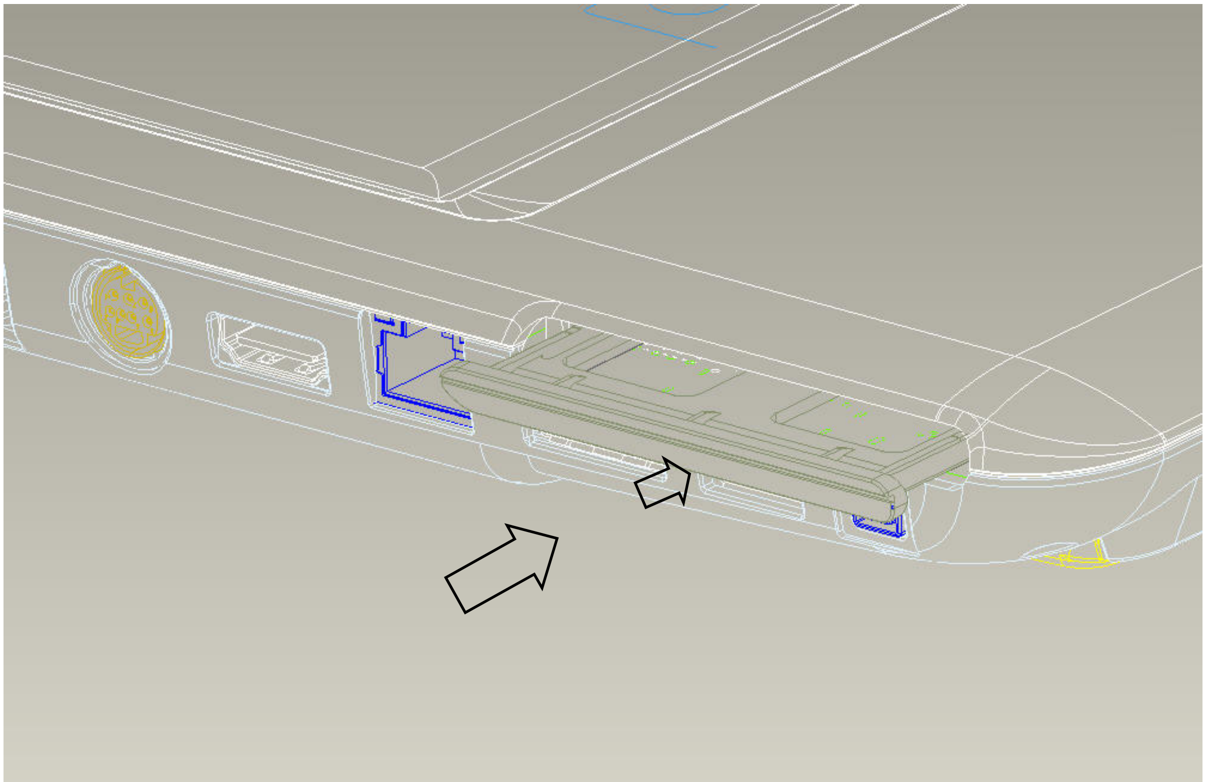


Figure 4-3-1 Insert a PC card

4.4 HDD

Removing a MAIN HDD-H9.5mm / HDD-H12.5mm

The following describes the procedure for removing the main HDD (See Figure 4-3 to 4-4).

> ***CAUTION:*** *Take care not to press on the top or bottom of a HDD. Pressure may cause data loss or damage to the device.*

1. Turn the computer upside down.
2. Remove the following **screws** securing a HDD slot cover and remove a **HDD slot cover**.
   - M2.5×4.0B FLAT BIND screw x2
3. Remove the following **screws** securing the **HDD assembly**.
   - M2.5×5.0B FLAT BIND screw x2
4. Disconnect the **HDD assembly** from the connector on the system board**.**

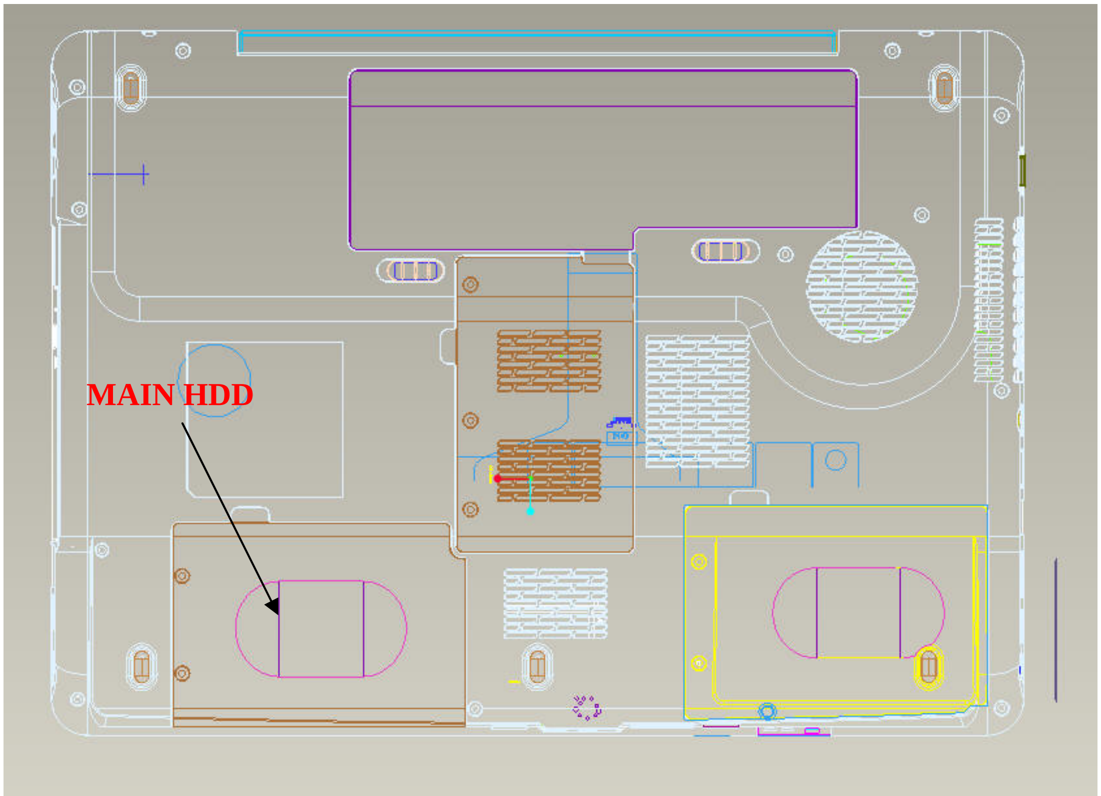


Figure 4-4 Turn the compute upside down

CAUTION: *When a HDD is installed, they are installed in the position as the following figure.*

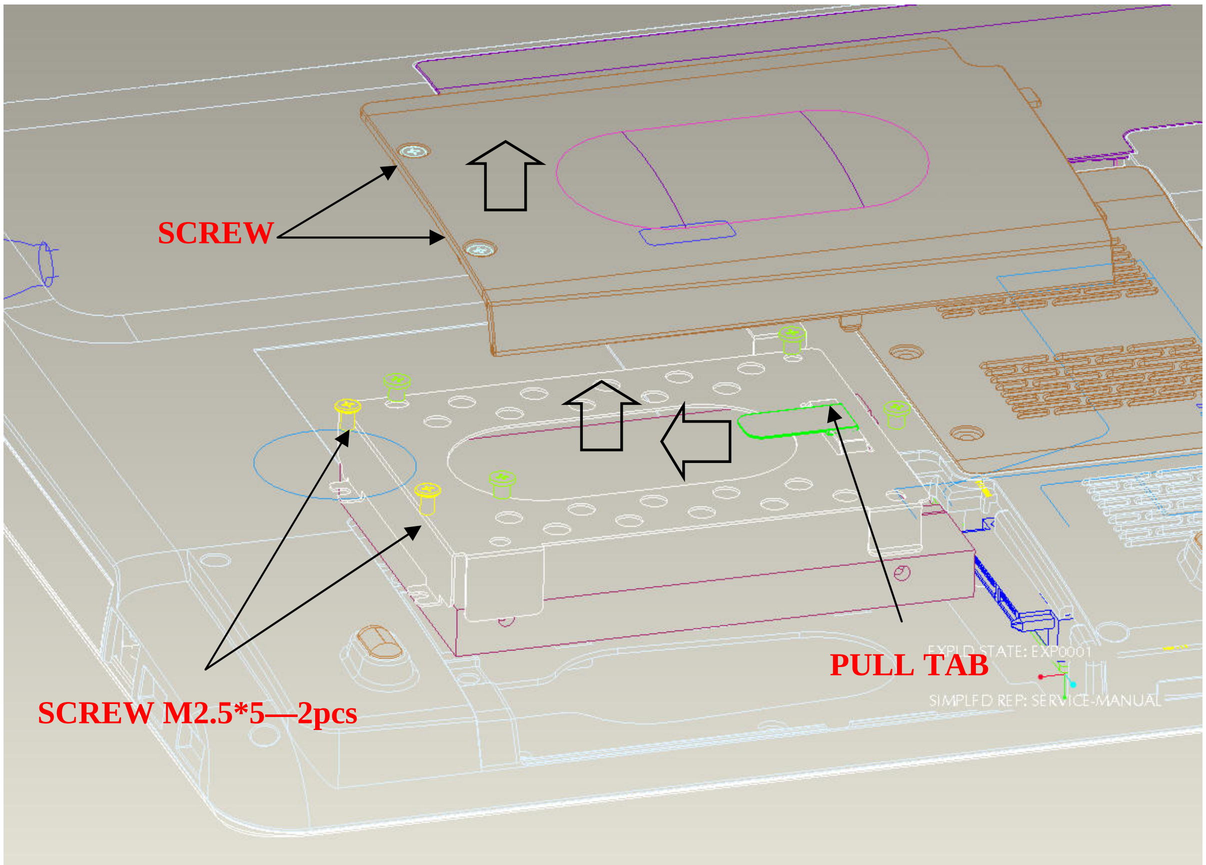


Figure 4-5-1 Remove the MAIN HDD assembly

5. Remove the following **screws** securing the HDD holder and remove the **HDD holder**.

- M3.0×3.0B FLAT BIND screw x4

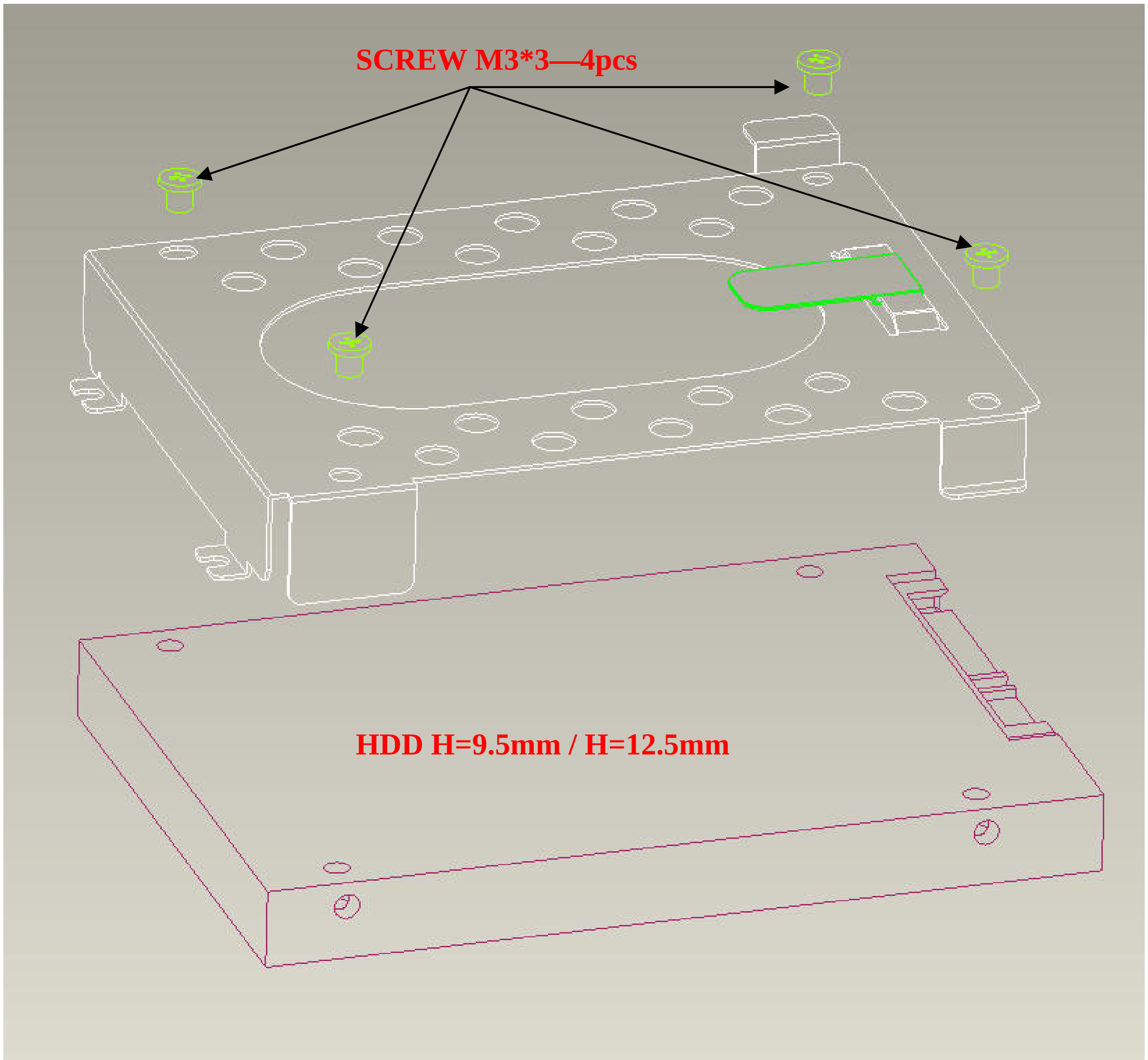


Figure 4-4 Remove MAIN HDD

Installing MAIN HDD-H9.5mm / HDD-H12.5mm

The following describes the procedure for installing the main HDD (See Figure 4-3 to 4-4).

1. Install a HDD to the **HDD holder** and secure it with the following **screws**.

   - M3.0×3.5F FLAT BIND screw x4

NOTE: *Although they are 3mm head screws, screw torque must be set in 2.5kg-cm for four screws securing the HDD holder.*

2. Insert the **HDD assembly** into the HDD slot and connect it carefully to the **MAIN HDD** on the system board.

3. Secure the **HDD assembly** with the following **screw**.

   - M2.5×4.0B FLAT BIND screw x2

4.5 HDD

Removing second HDD-H9.5mm / HDD-H12.5mm

The following describes the procedure for removing the second HDD (See Figure 4-3 to 4-4).

CAUTION:	*Take care not to press on the top or bottom of a HDD. Pressure may cause data loss or damage to the device.*

4. Turn the computer upside down.
5. Remove the following **screws** securing a HDD slot cover and remove a **HDD slot cover**.
    - M2.5×4.0B FLAT BIND screw x2
6. Remove the following **screws** securing the **HDD assembly**.
    - M2.5×5.0B FLAT BIND screw x2
7. Disconnect the **HDD assembly** from the connector on the system board**.**

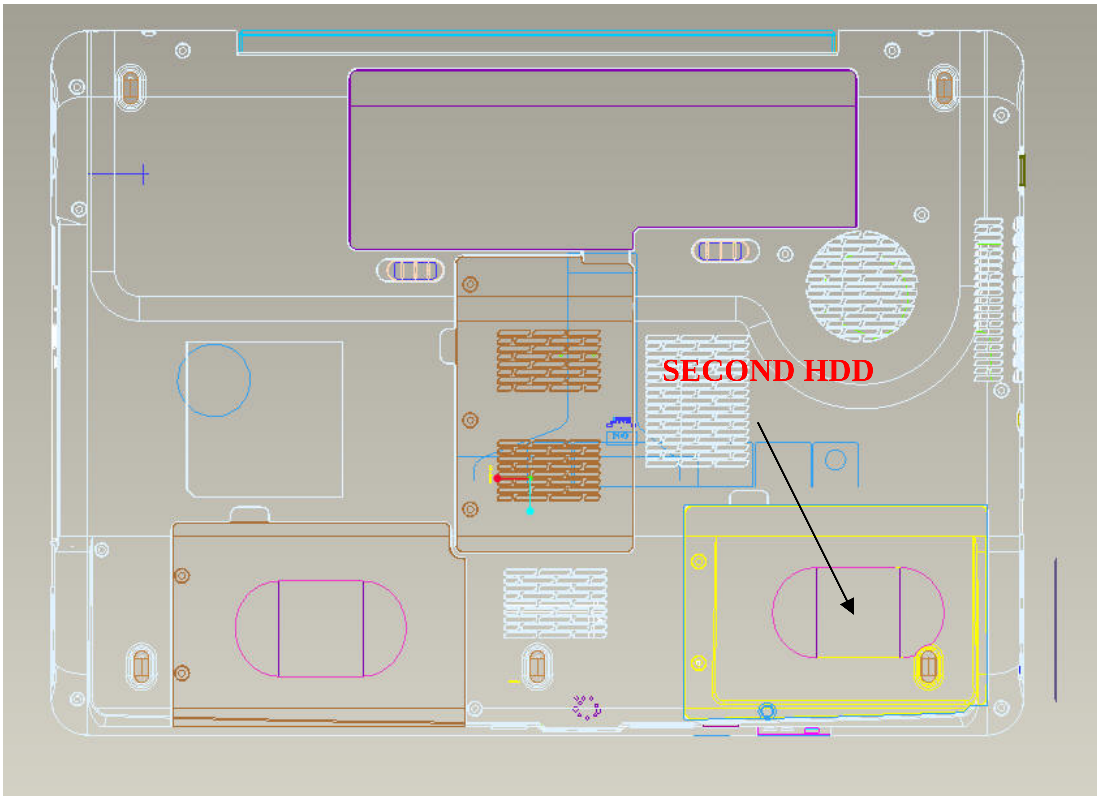


Figure 4-4-1 Turn the computer upside down

CAUTION: *When a HDD is installed, they are installed in the position as the following figure.*

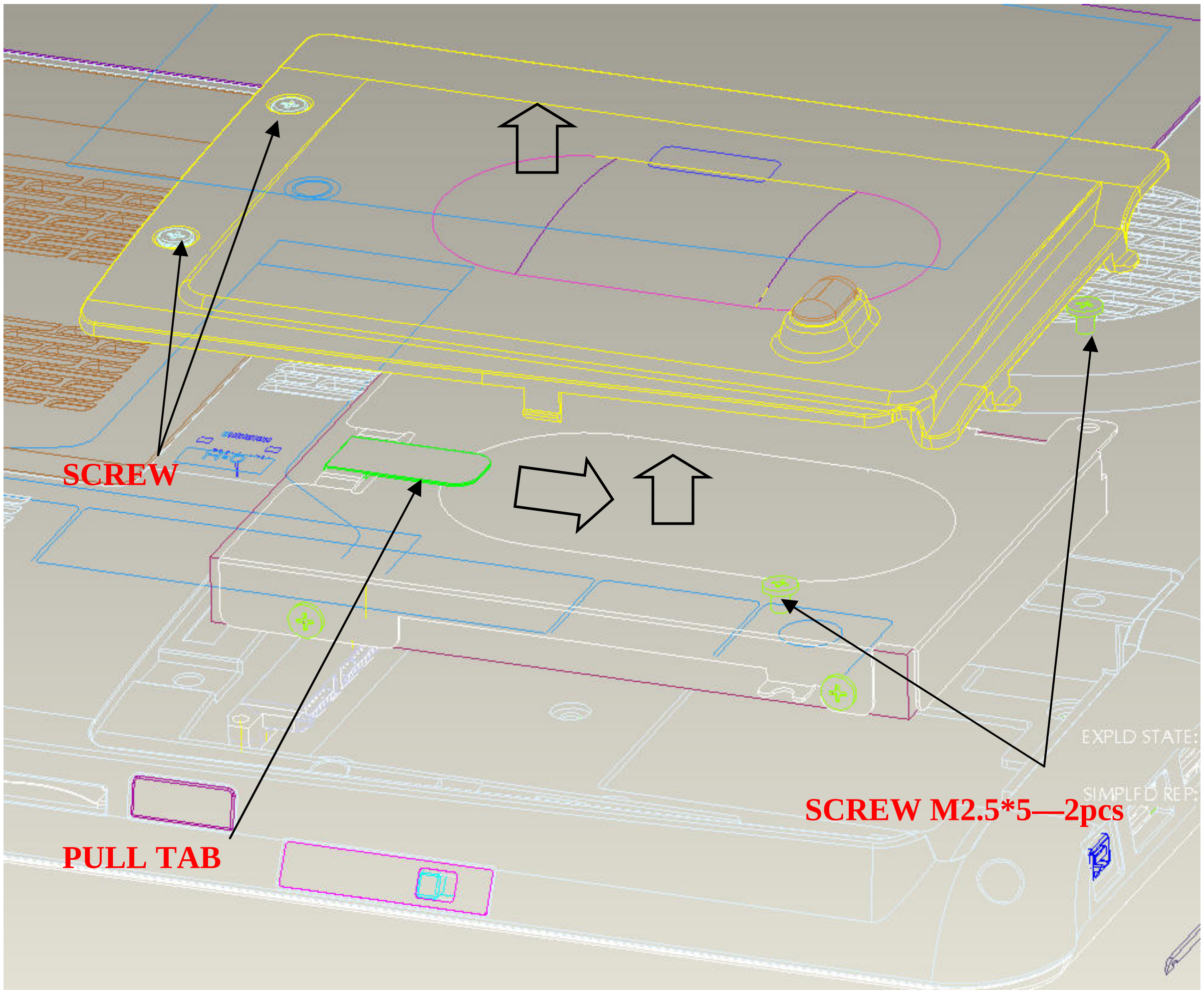


Figure 4-4-2 Remove the SECOND HDD assembly

8. Remove the following **screws** securing the HDD holder and remove the **HDD holder**.

   - M3.0×3.0B FLAT BIND screw x4

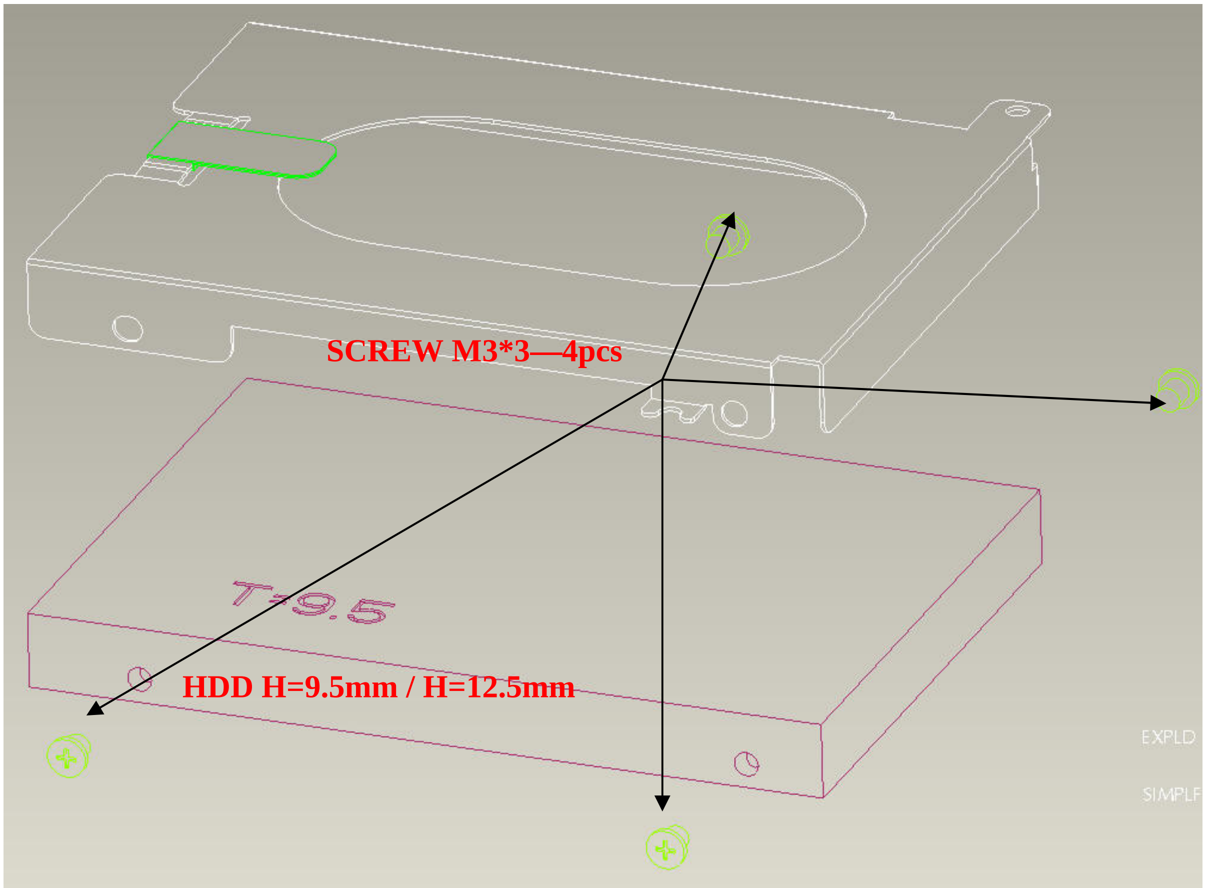


Figure 4-4-3 Remove the screws and HDD holder

Installing Second HDD-H9.5mm / HDD-H12.5mm

The following describes the procedure for installing a HDD (See Figure 4-3 to 4-4).

9. Install a HDD to the **HDD holder** and secure it with the following **screws**.

    - M3.0×3.5F FLAT BIND screw x4

> ***NOTE:*** *Although they are 3mm head screws, screw torque must be set in 2.5kg-cm for four screws securing the HDD holder.*

10. Insert the **HDD assembly** into the HDD slot and connect it carefully to the **MAIN HDD** on the system board.

11. Secure the **HDD assembly** with the following **screw**.

    - M2.5×4.0B FLAT BIND screw x2

4.6 Wireless LAN card

Removing a Wireless LAN card

The following describes the procedure for removing a Wireless LAN card (See Figure 4-5).

1. Remove the following **screw** of wireless cover securing **wireless LAN card cover** and remove it. And remove screw of wireless board

    - 2.5.0 x 4.0B BIND screw x3

2. Disconnect the **wireless LAN antenna cable** from the connectors on a wireless LAN card.

3. Open the left and right latches holding a wireless LAN card and remove a **wireless LAN card** from the **connector** on the system board.

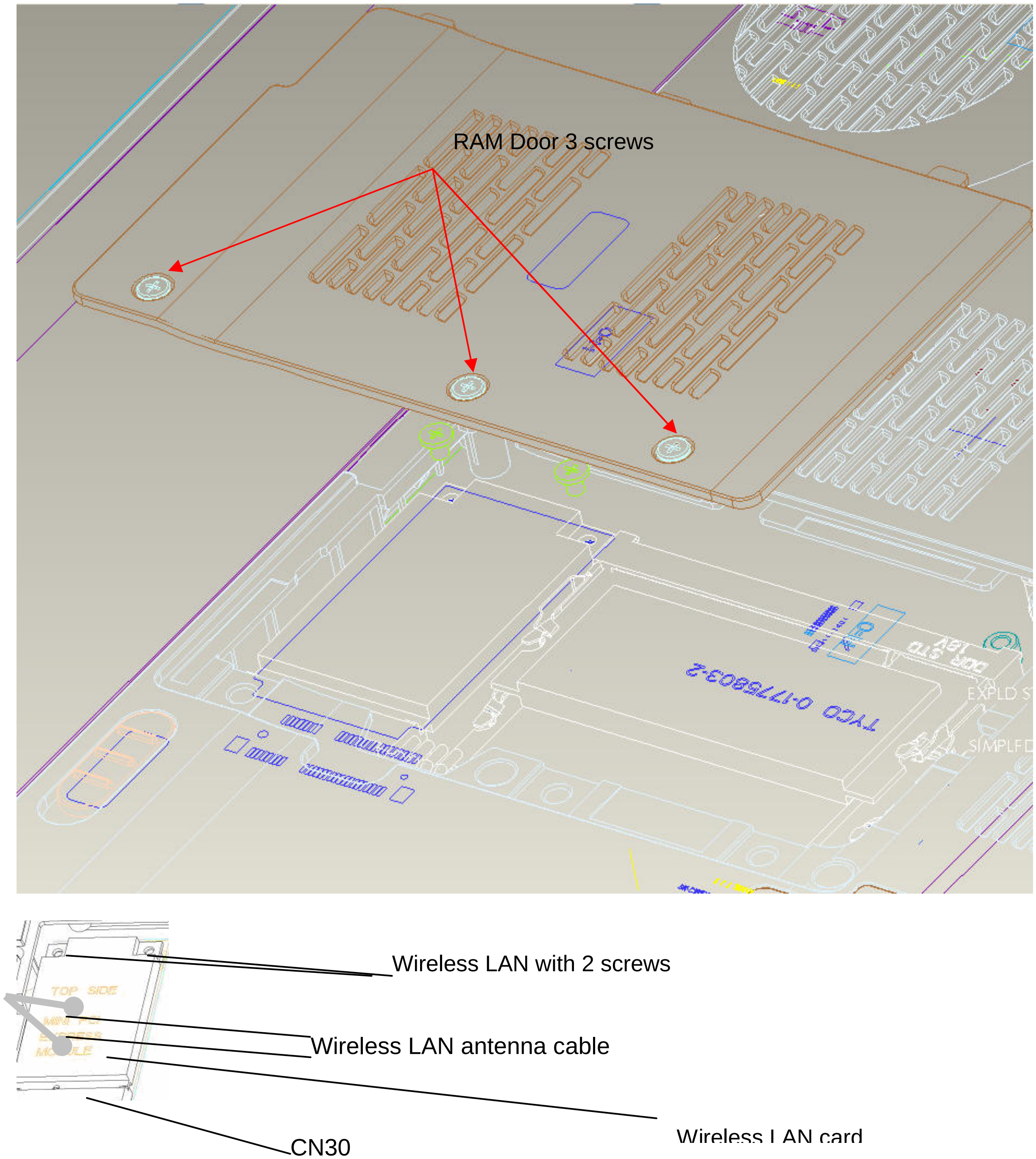


Figure 4-5 Remove a wireless LAN card

Installing a Wireless LAN car

The following describes the procedure for installing a Wireless LAN card (See Figure 4-5).

1. Insert a **wireless LAN card** terminals slantwise into the connector on the computer and press a wireless LAN card and lock the secure screws.

2. Connect the **wireless LAN antenna cables** to the terminals on a wireless LAN card.

3. Install the **wireless LAN card cover** and secure it with the following **screw**.

4.7 Memory module

> ***CAUTION:*** *The power of the computer must be turned off when you remove a memory module. Removing a memory module with the power on risks damaging the module or the computer itself.*
>
> *Do not touch memory module terminals. Any dirt on the terminals may cause memory access problems.*
>
> *Never press hard or bend a memory module.*

Removing a memory module

To remove a memory module, confirm that the computer is in boot mode. Then perform the following procedure (See Figure 4-6).

1. Loose the **screw** securing the **memory slot cover**.
2. Remove the **memory slot cover**.
3. Open the left and right **latches** and remove a **memory module**.

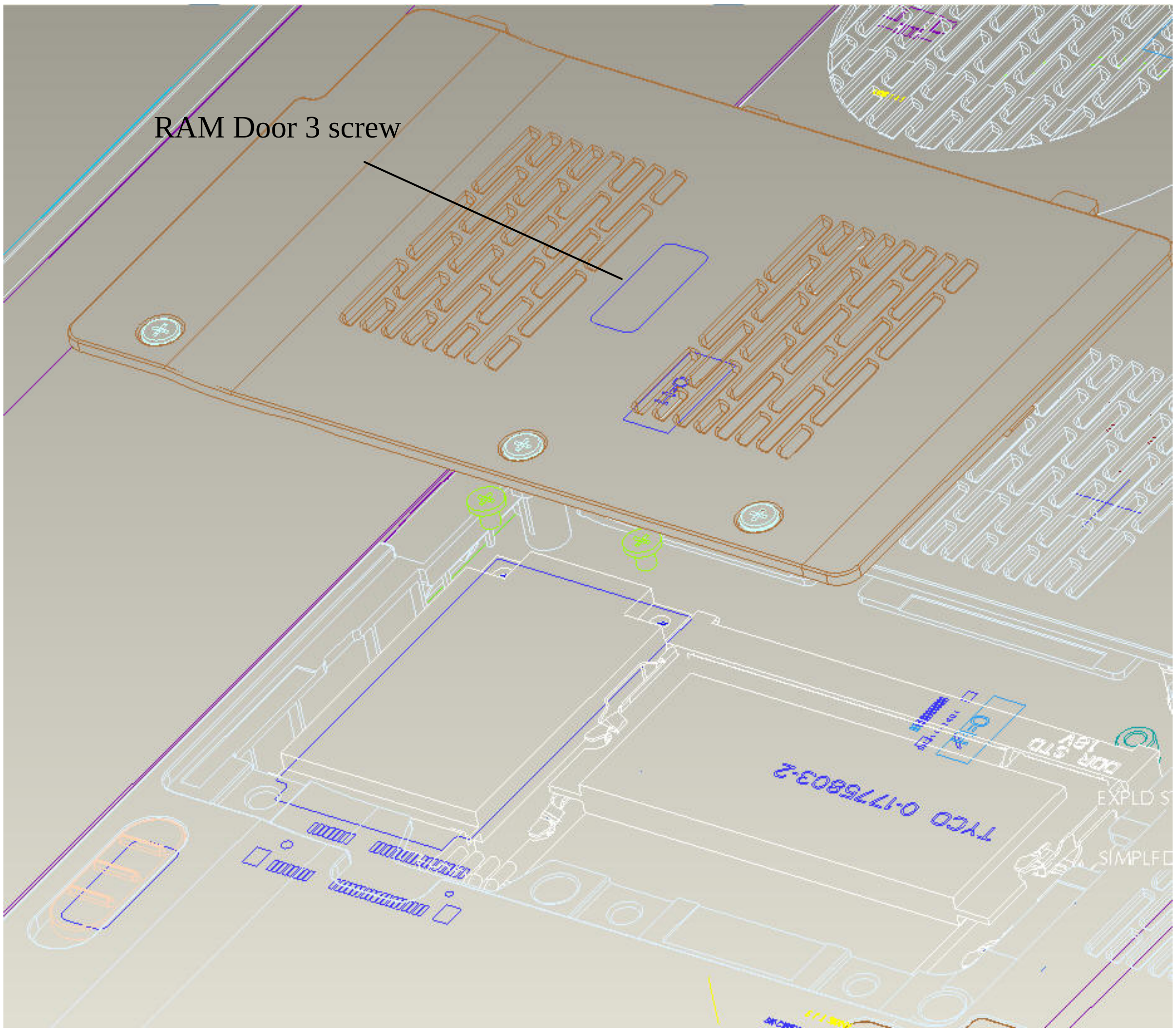


Figure 4-6 Remove memory slot cover

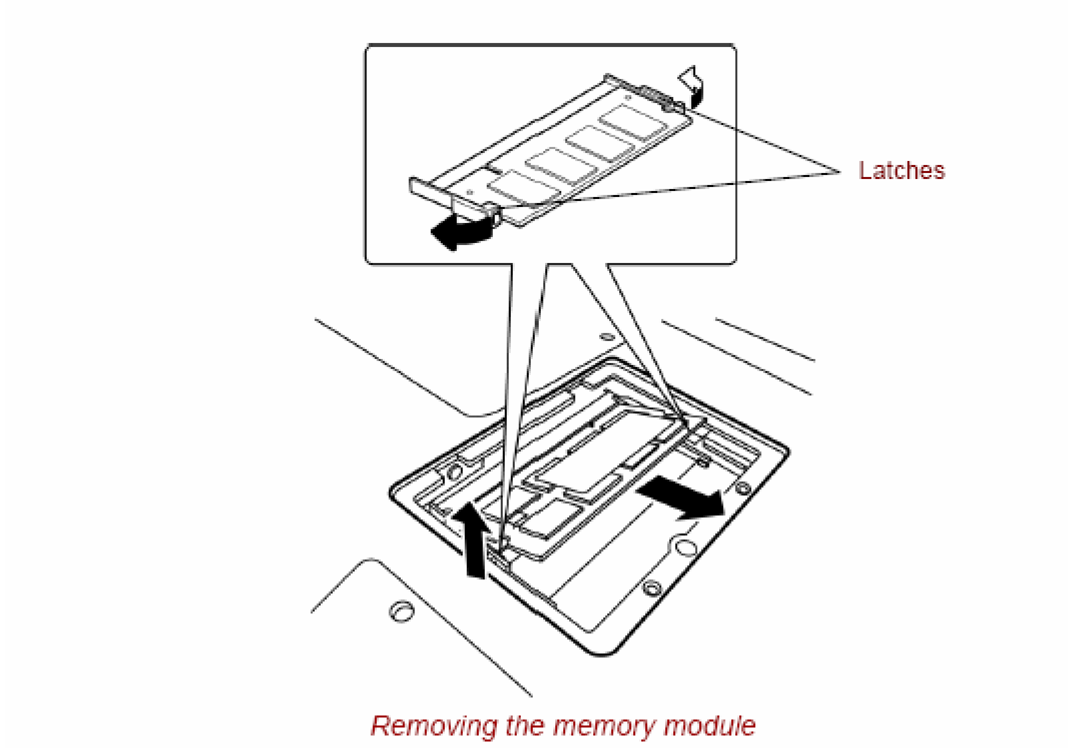


Figure 4-6-1 Remove a memory module

Installing a memory module

To install a memory module, confirm that the computer is in boot mode. Then perform the following procedure (See Figure 4-7).

1. Insert a **memory module** into the connector of the computer slantwise (terminal side first) and press it to connect firmly.

CAUTION:	*The power must be turned off when you insert a memory module. Inserting a memory module with the power on might damage the module or the computer itself.* *Never press hard or bend a memory module.*

2. Install the **memory slot cover** and secure it with the **screw**.
3. When the power of the computer is turned on, the computer checks automatically the memory size. Confirm that the new memory is detected correctly.
4. If the memory is not detected, check that it is connected correctly.

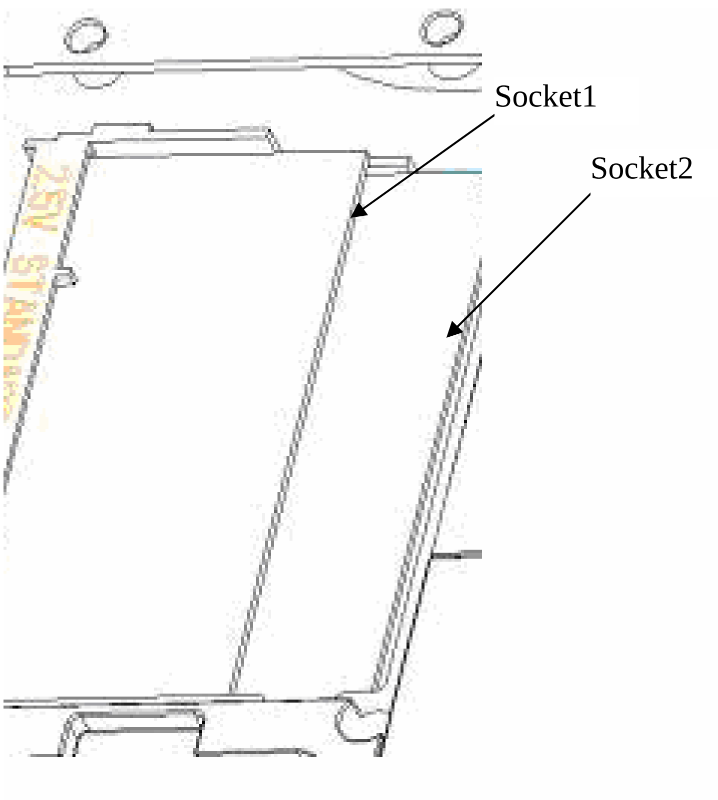


Figure 4-7 Insert a memory module

4.8 Keyboard

Removing the keyboard

The following describes the procedure for removing the keyboard (See Figure 4-8 to 4-9).

> ***CAUTION:*** *As the keycap may fall out, when handling the keyboard always hold it by the frame and do not touch the keycap.*

1. Turn the computer upside down
2. Loose the **screw** securing KBD Holder.

   M2.5x3.0B Flat BIND screws x3

3. Upside down the computer.
4. Open the display.
5. Remove KBD holder. Insert your finger into the slot between the KBD holder and the keyboard. Then, lift up the **keyboard cover** to remove it.
6. Insert your finger into the keyboard slot and keyboard. Then lift up the keyboard to remove it.
7. Disconnect keyboard cable.

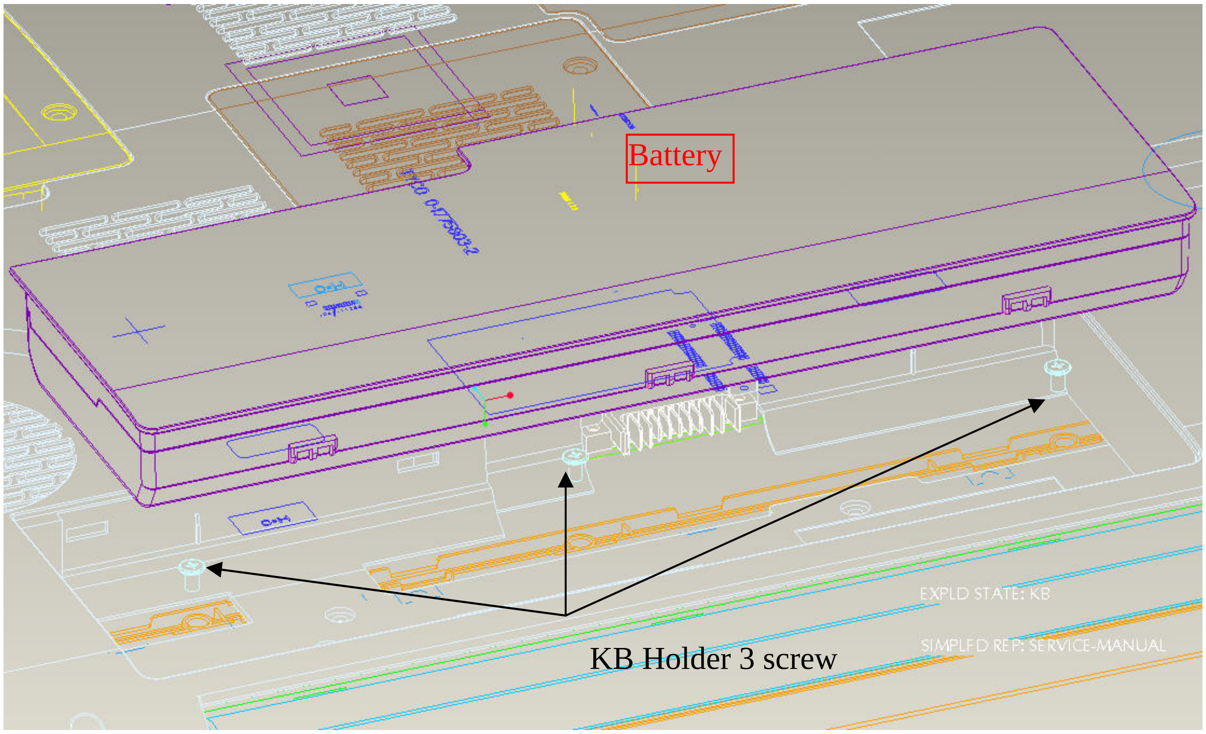


Figure 4-8 Remove screws for KB Holder

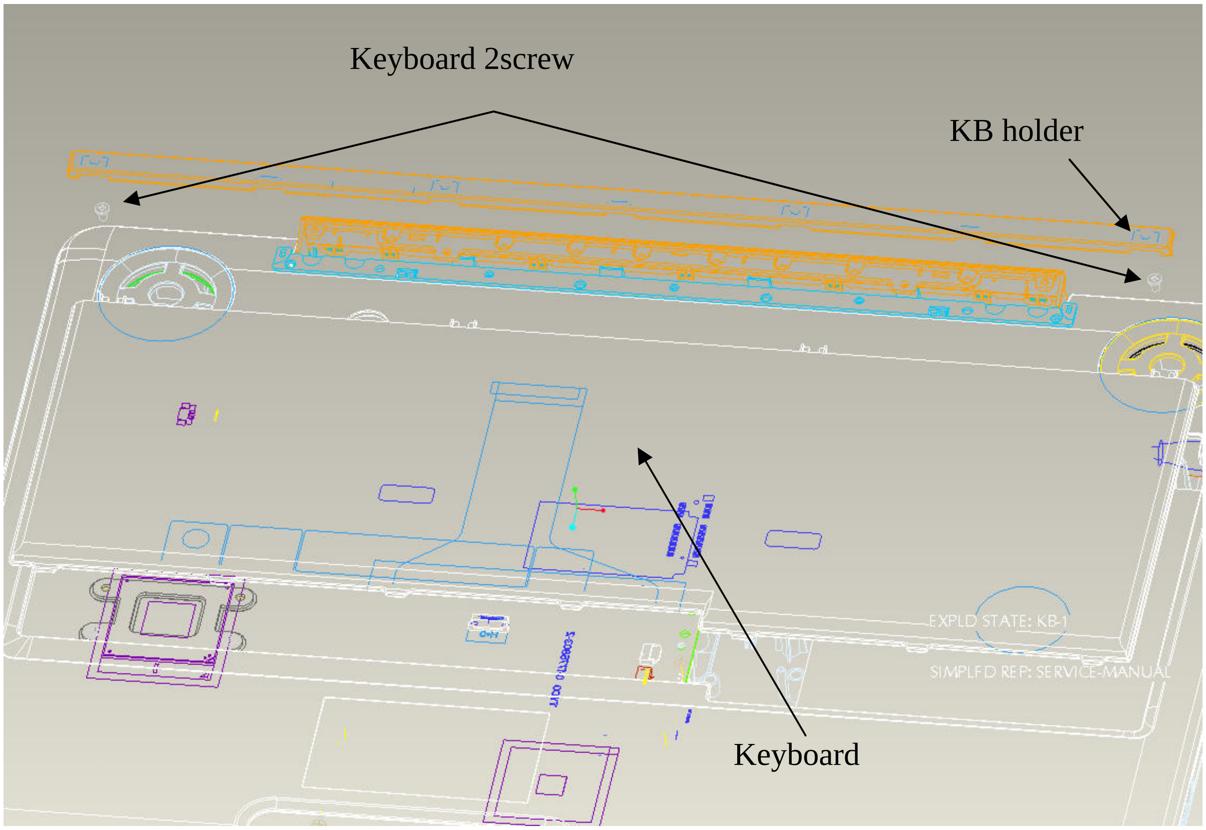


Figure 4-9 Remove the keyboard/KB Holder

Installing the keyboard

The following describes the procedure for installing the keyboard (See Figure 4-8 to 4-9).

1. Turn the **keyboard** upside down and place it on the palm rest as its face down. Connect the **keyboard flexible cable** to the connector on the system board.

2. Slide and set the **speaker cover assembly** and secure it with the following **screw**.

    - M2.5×5.0B FLAT BIND screw x2

3. Install the **keyboard brace** by pressing it from the topside.

4.9 Optical disk drive

> ***NOTE:*** *Do not apply excessive force to the top of an optical disk drive.*
>
> *Do not touch the shaded portion of the figure below, when the drive is removed or installed.*

Removing an optical disk drive

The following describes the procedure for removing an optical disk drive (See Figure 4-11and 4-12).

1. Remove **Keyboard** and next remove the following **screws** securing an optical disk drive.

    - M2.5×5.0B FLAT BIND screw x1

2. Disconnect an **optical disk drive** toward the arrow direction from the connector **CN26** on the system board.

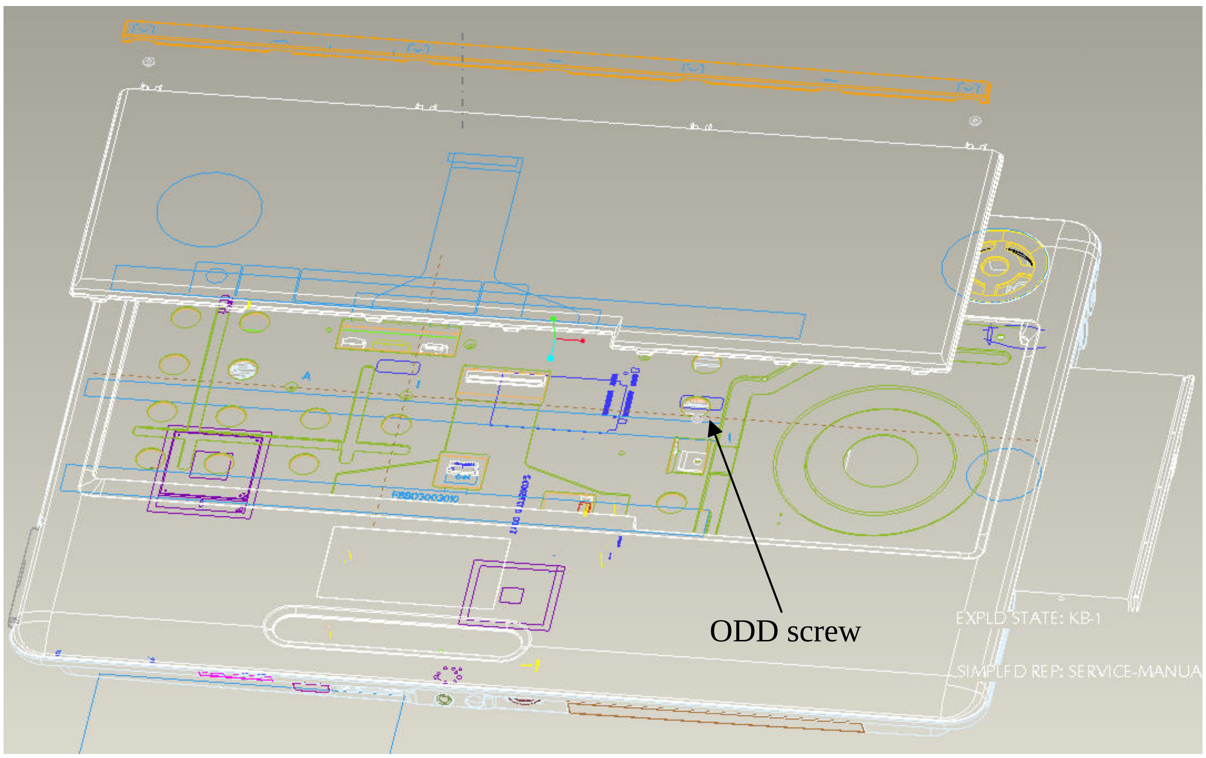


Figure 4-10 Remove an optical disk drive

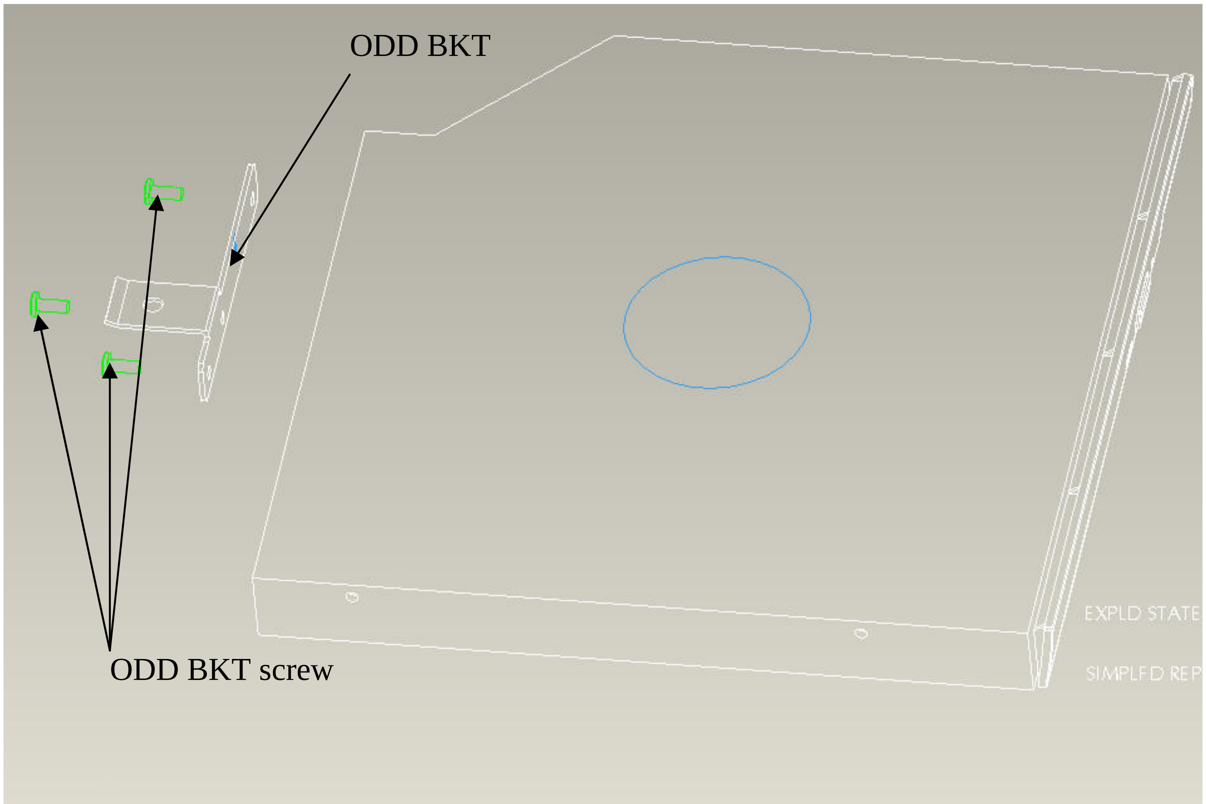


Figure 4-11 Disassemble the side bracket

Installing an optical disk drive

The following describes the procedure for installing an optical disk drive (See Figure 4-11 and 4-12).

1. Attach the **ODD bracket** to an optical disk drive and secure it with the following **screws**.

   - M2.0×3.0 Flat BIND screw x3

2. Insert an optical disk drive assembly into the slot and connect it to the connector **CN26** on the system board.

3. Secure the ODD drive with the following **screw**.

   M2.5X5.0 Flat BIND screw X1

4.10 Display assembly

Removing the display assembly

The following describes the procedure for removing the display assembly (See Figure 4-13 to 4-17).

1. Close the display and turn the computer upside down.
2. Open the RAM Door and remove antenna cable Connector.

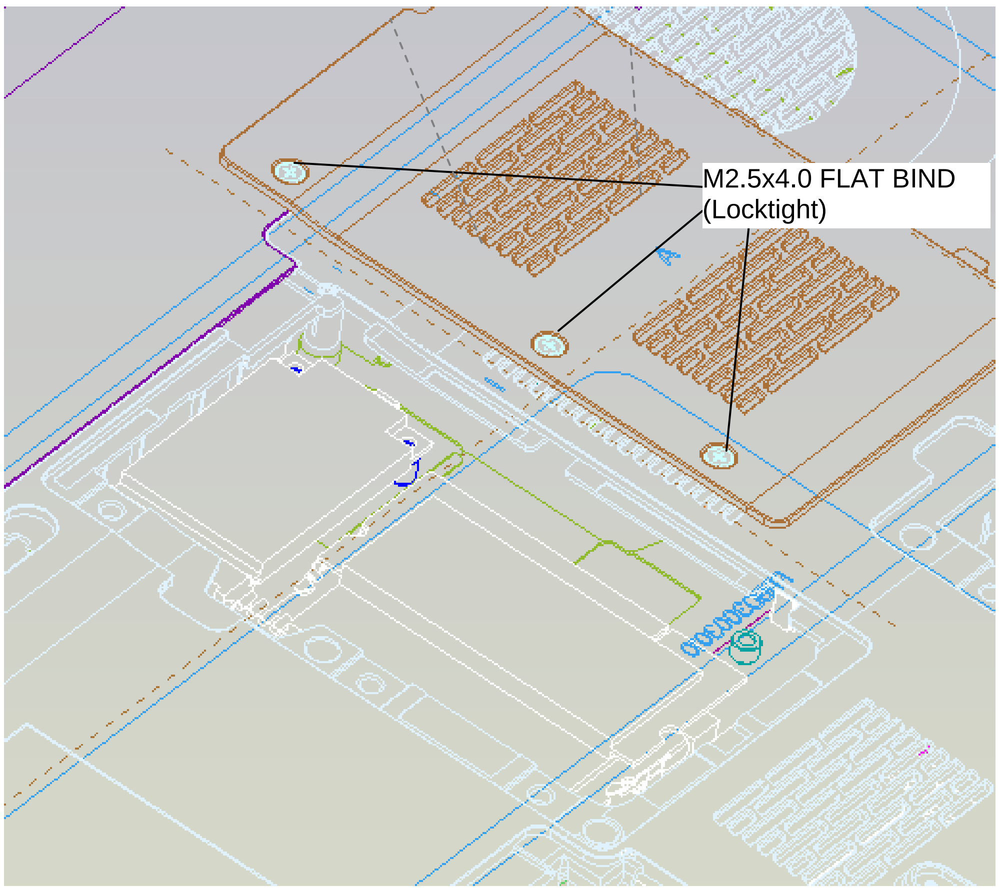


Figure 4-12 Remove the screws (securing display assembly)

3. Remove Battery and disassembly **k/b holder** and **keyboard** screw. (please refer figure 4-8,figure4-9).

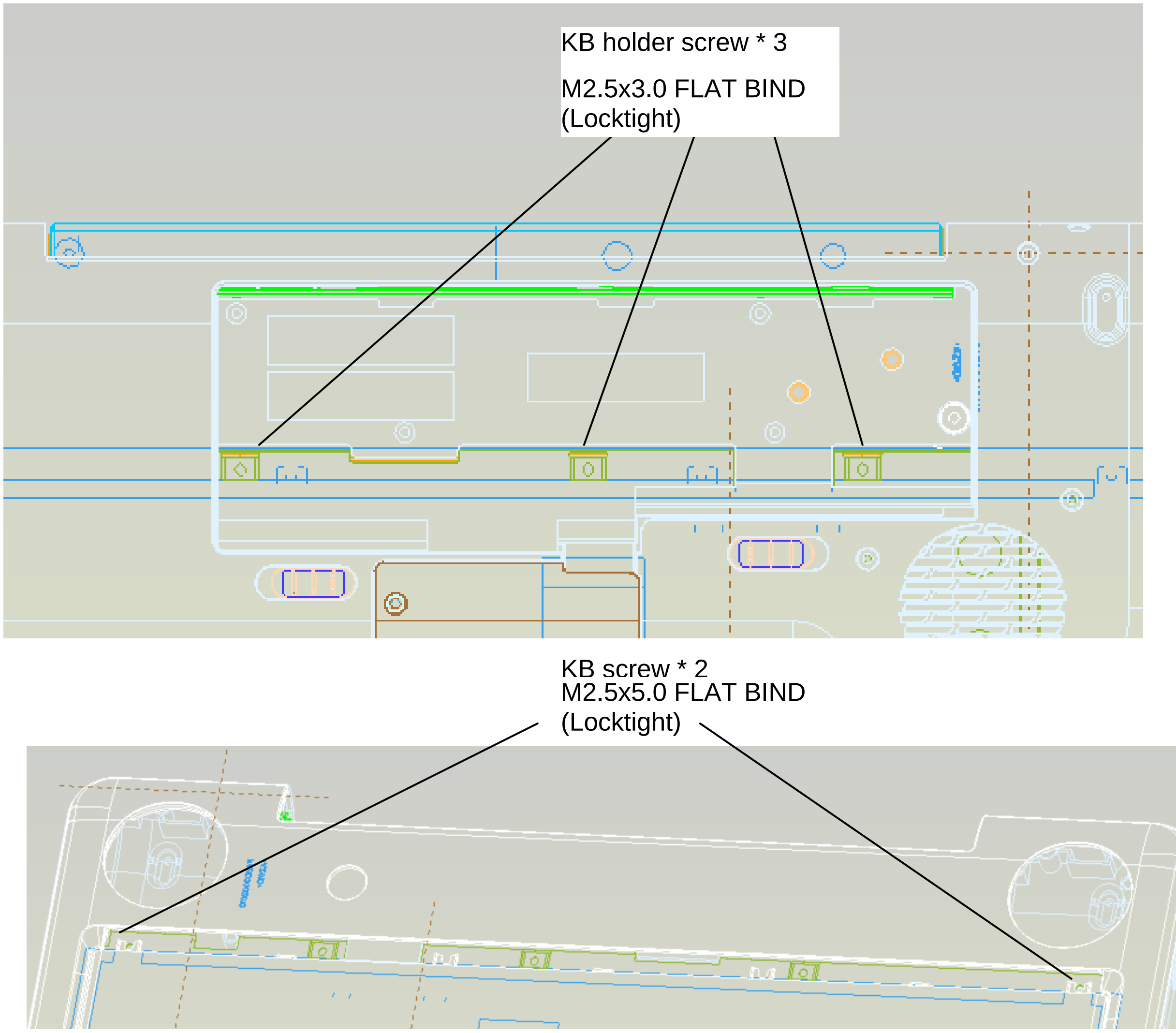


Figure 4-12-1 Remove the KB screws

4. Disassembly TOP ASSY

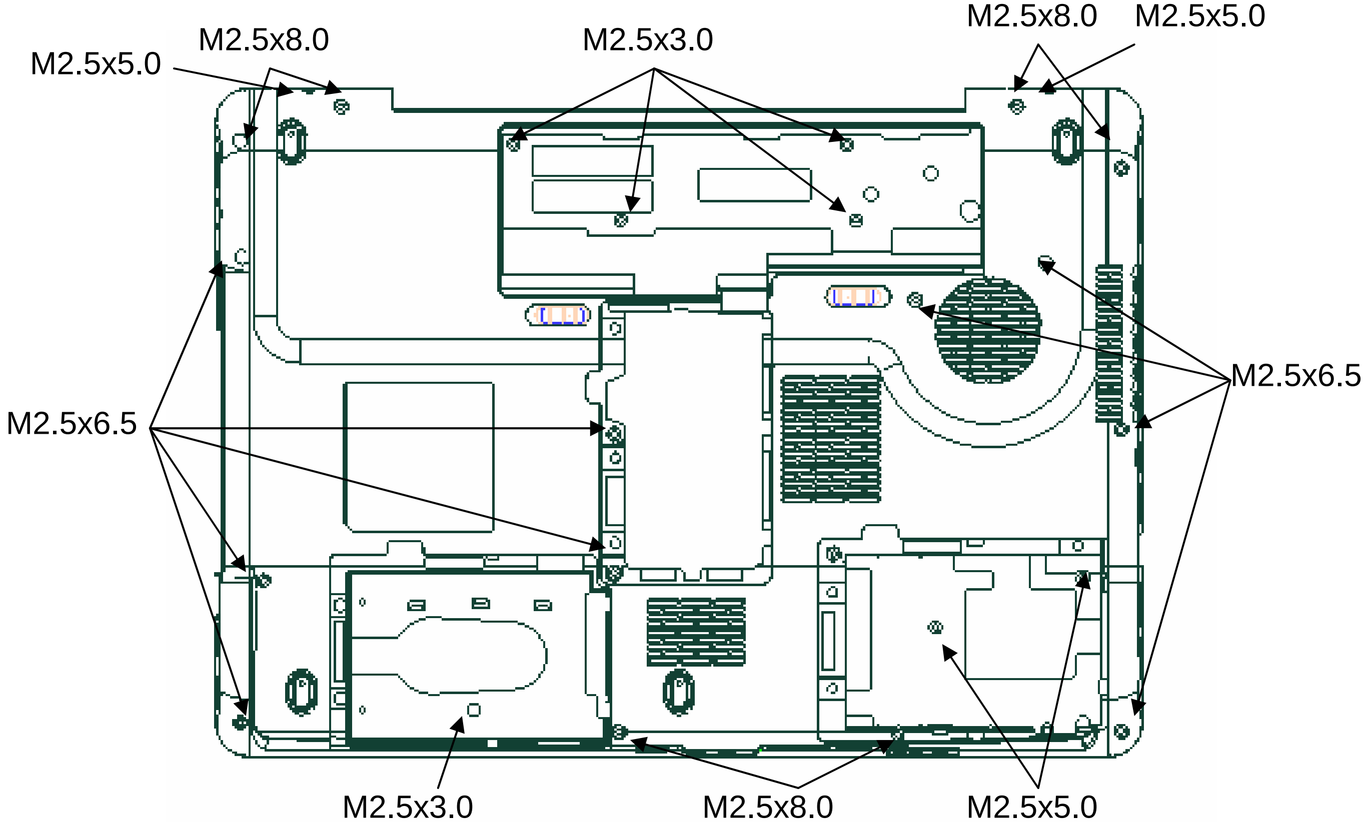


Figure 4-13 Remove the screws (from bottom side)

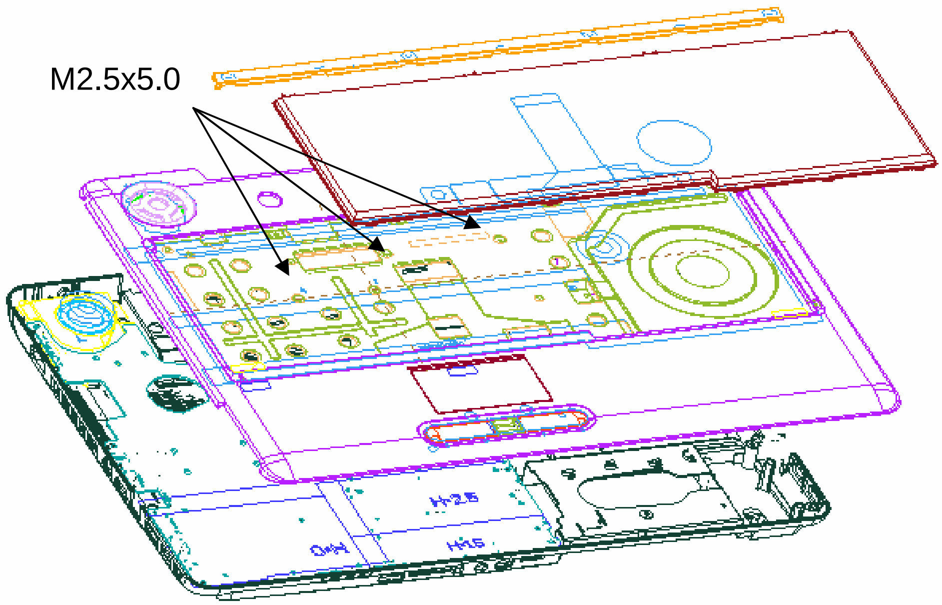


Figure 4-14 Remove the screws (from top side)

5. Pull out the **wireless LAN antenna and LCD cables** from the guide

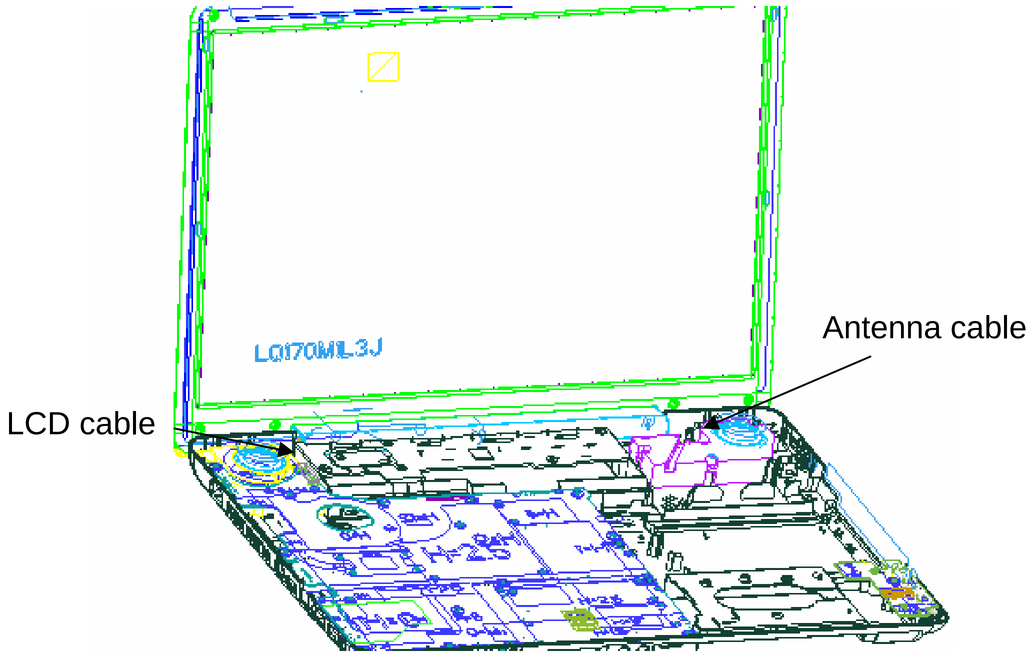
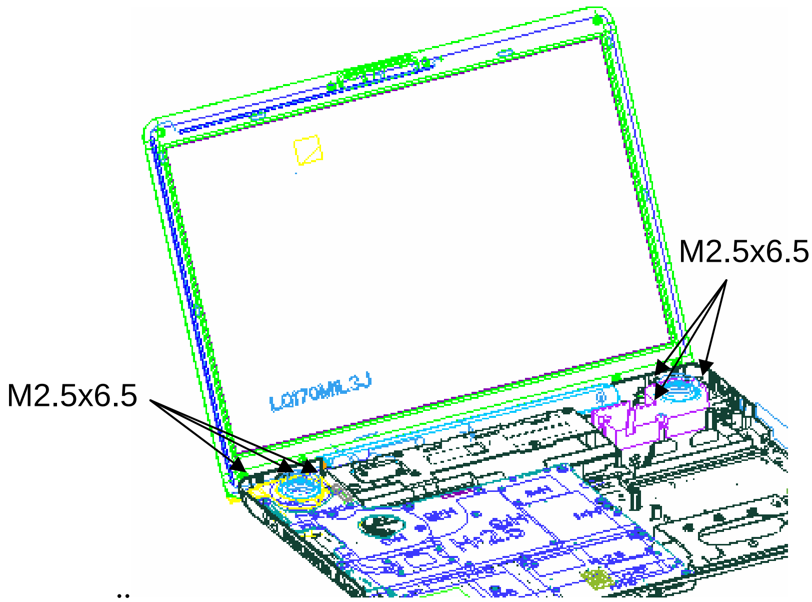


Figure 4-15 Remove the Wireless Antenna and LCD cable

Opening the display to 135degree, and remove the hinge screw.

M2.5×6.5 FLAT BIND screw x6 (Locktight)



..

Figure 4-16 Remove the hinge screws

6. Pulling out the **pole of hinge** from the **hole** of hinge assembly, remove the **display assembly** from the base assembly.

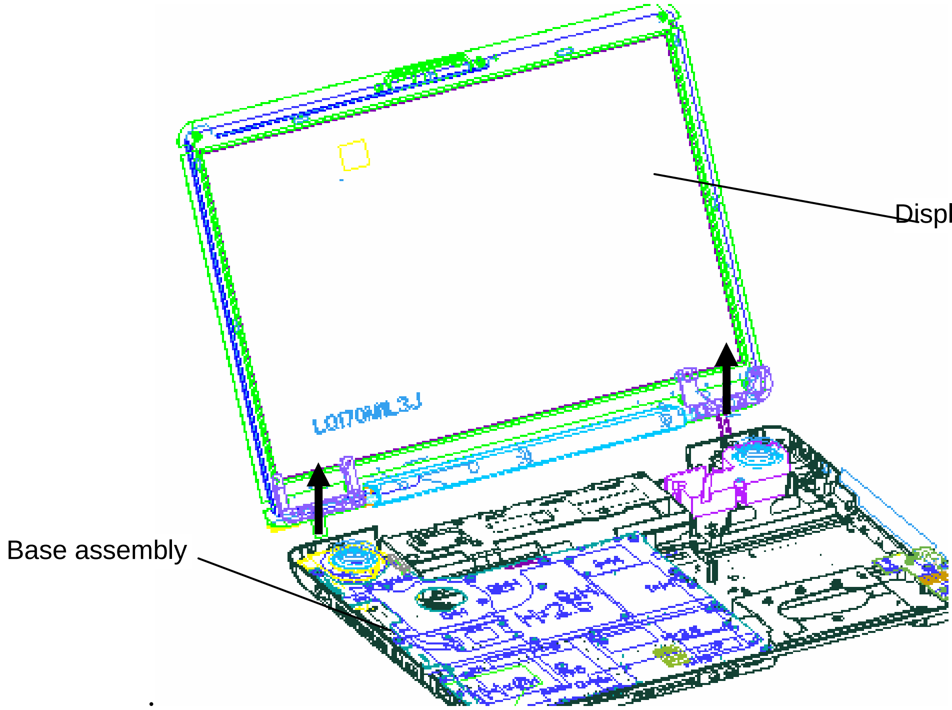


Figure 4-17 Remove the LCD harness and remove display assembly

Installing the display assembly

The following describes the procedure for installing the display assembly (See Figure 4-13 to 4-17).

1. Inserting the **pole of hinge** to the **hole** of hinge assembly, set the **display assembly** on the base assembly.

2. Secure the **hinges** with the following **screws** secure the **display mask** with the following **screws** and stick the **mask seal** on them.

   - M2.5×6.5 FLAT BIND screw (Locktight) x6

> ***NOTE**: Be sure to apply the locktight to the screws instructed in the figure above.*

3. Connect the **LCD harness** to the connector on the system board.

4. Arrange the wireless antenna cables along the guide (front) and secure them with **guide**.

5. Pass the cables to the back of computer through the **slot**.

6. Arrange the **wireless LAN antenna** along the guide and contact with the connector.

7. Install the LAN board and cover ASSY of the system.

4.11 Cover assembly

Removing the cover assembly

The following describes the procedure for removing the cover assembly (See Figure 4-19 to 4-21).

1. Turn over the computer.
2. Remove the following **screws** securing the cover assembly from the back and bottom of computer.

- M2.0×5.0 FLAT BIND screw Back x4
- M2.5×6.5 FLAT BIND screw Back x11
- M2.5×8.0 FLAT BIND screw Back x4
- M2.0×3.0 FLAT BIND screw Back x5

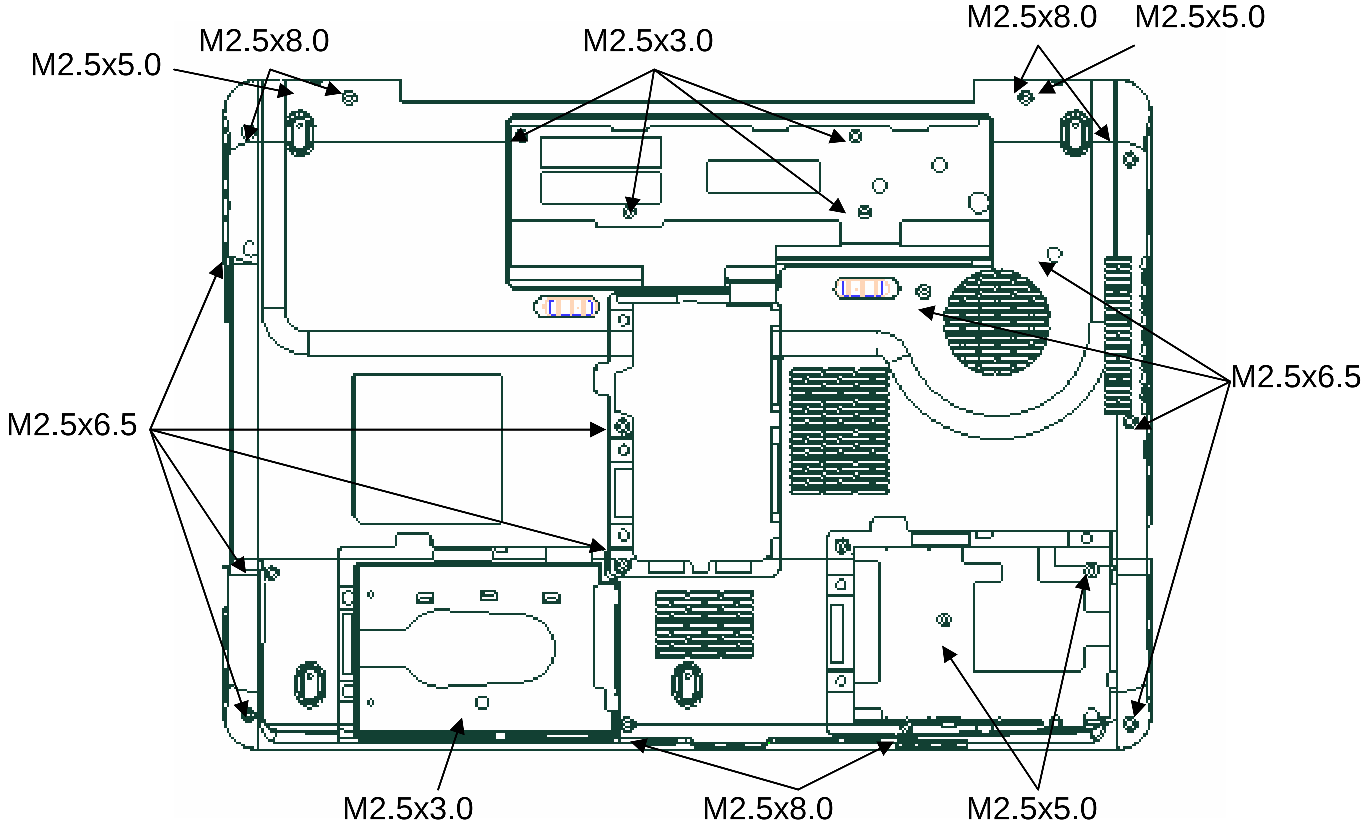


Figure 4-18 remove the screws (back)

3. Disconnect the **touch pad flat cable/Fingerprint cable** from the connector on the system board.

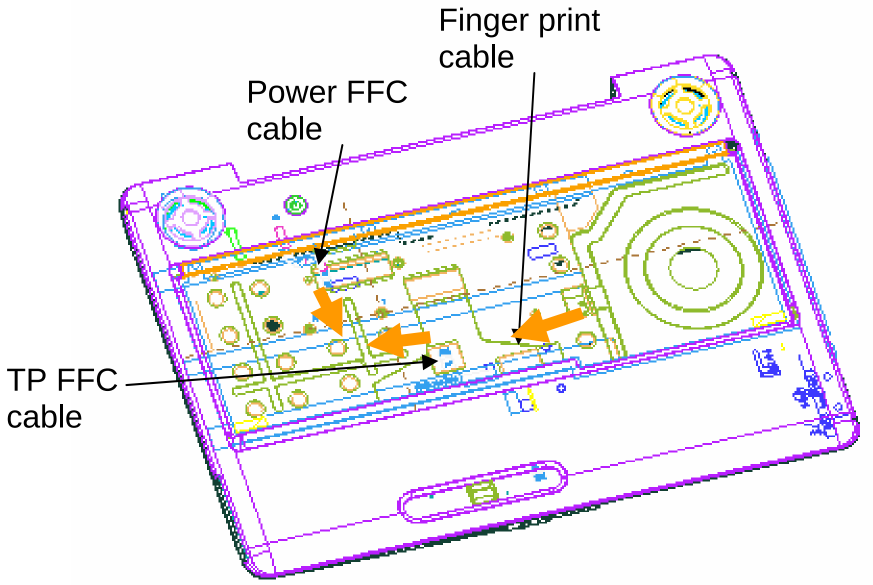


Figure 4-19 Disconnect the touch pad flat cable/Fingerprint cable

4. Remove the following **screws** securing the cover assembly from the front of computer. Pull up and remove the **cover assembly** from the **base assembly**.

M2.0×5.0 FLAT BIND screw Front x3

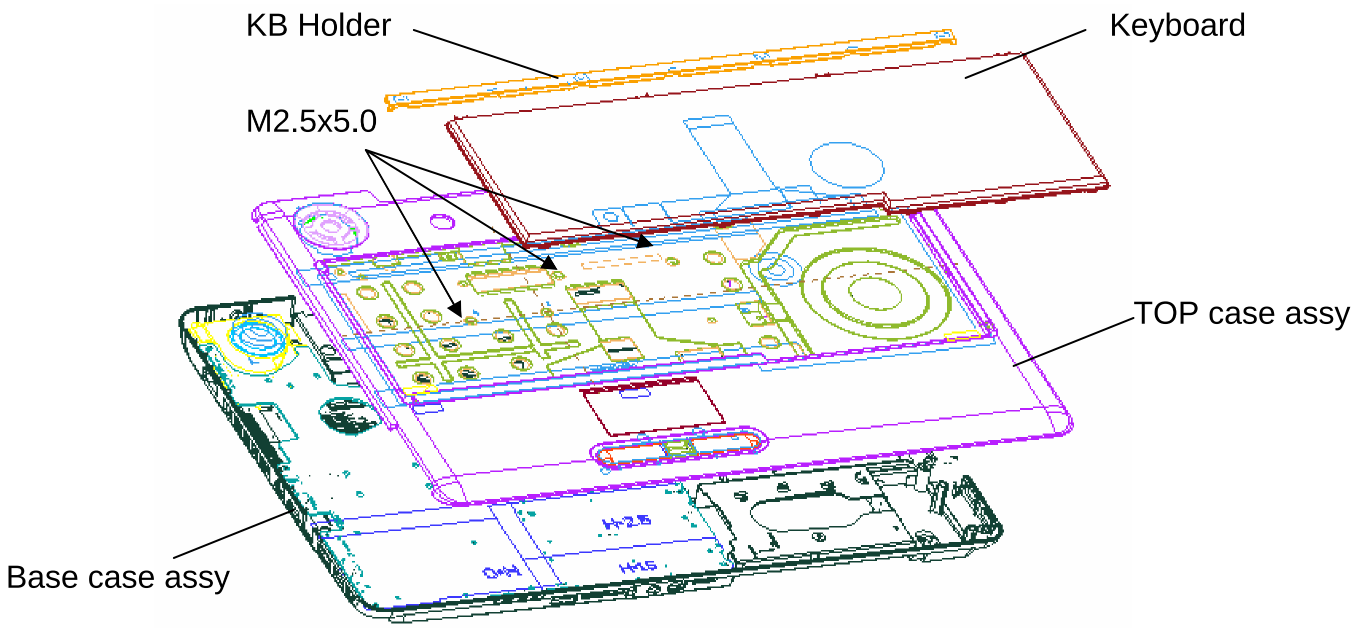


Figure 4-20 Remove the screws (front) and cover assy

Installing the cover assembly

The following describes the procedure for installing the cover assembly (See Figure 4-19 to 4-21).

1. Install the **cover assembly** to the base assembly.

> ***NOTE**: Be careful not to catch the cables between cover assembly and base assembly.*

2. Connect the **touch pad flat cable** to the connector on the system board.
3. Secure the cover assembly with the following **screws** from the back and bottom of computer.

   - M2.0×5.0 FLAT BIND screw Back x4
   - M2.5×6.5 FLAT BIND screw Back x11
   - M2.5×8.0 FLAT BIND screw Back x4
   - M2.0×3.0 FLAT BIND screw Back x5

4. Free the cable from cable-drain when through the antenna cable to PCB hole.

4.12 Touch pad

Removing the touch pad

The following describes the procedure for removing the touch pad (See Figure 4-22).

1. Peel off the **glass tape** and disconnect the **touch pad flat cable, finger print cable** from the connector on the touch pad.

2. Remove the following **screws** securing the touch pad plate.

    - M2.0×3.0B SUPER THIN HEAD screw x6

3. Remove the **touch pad board and touch pad plate**.

4. Peel off and remove the **touch pad** from the cover assembly.

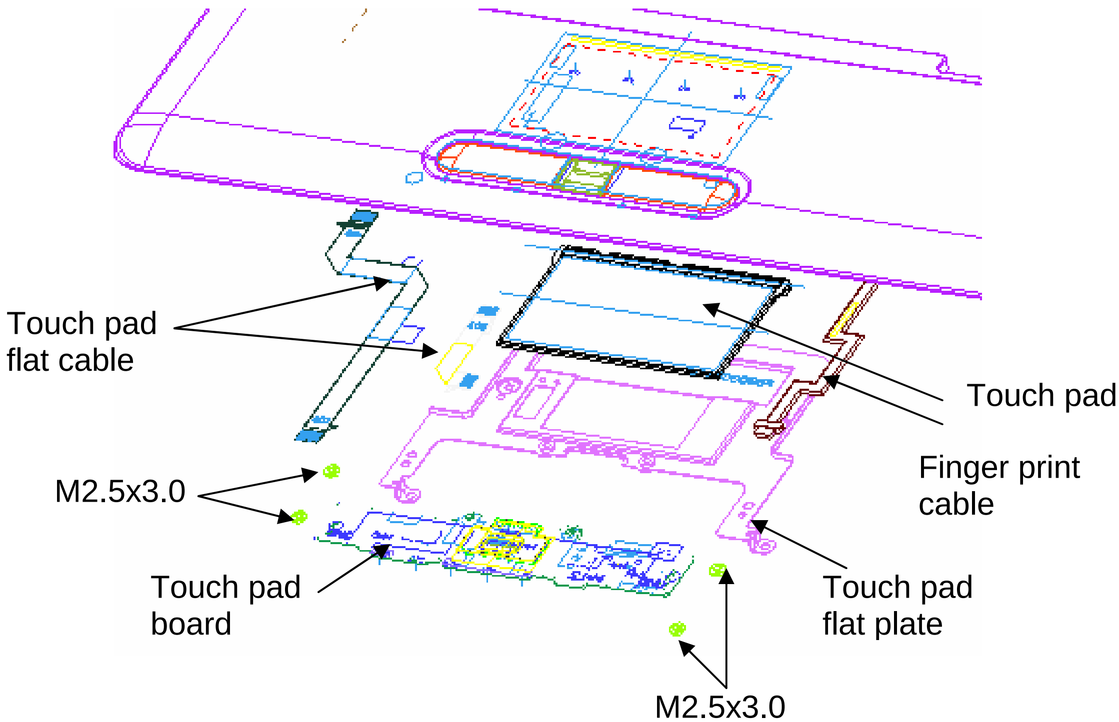


Figure 4-21 Remove the touch pad

Installing the touch pad

The following describes the procedure for installing the touch pad (See Figure 4-22).

1. Peel off the separator covering on the sensor portion of a new touch pad.

> ***NOTE:*** *Do not reuse the touch pad so that it can not be used after peeling off from the computer. Be sure to stick a new touch pad.*
>
> *When sticking the touch pad, be careful not to get the bubbles under the touch pad.*

2. Stick and install the **touch pad** on the cover assembly.
3. Install the **touch pad plate** and secure it with the following **screws**.
   - M2.0×3.0 SUPER THIN HEAD screw x7
4. Stick the **insulator** on the touch pad plate.
5. Connect the **touch pad flat cable** to the connector on the touch pad and stick the **glass tape** on the connector.

4.13 USB Board

The following describes for removing the cover assembly (See Figure 4-23).

Removing the USB board

1. Pull out the **USB cable, Modem cable,** from USB board connector.

2. Loose the below **screws** and then incline pull out **USB board.**

- M2.0x5.0 FLAT BIND screw x2

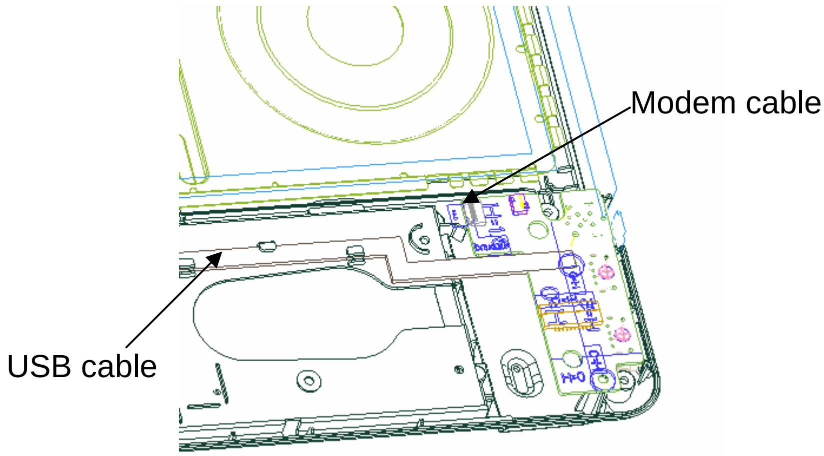


Figure 4-22 Remove the USB Board

Installing the USB board

1. Insert the **usb board** into base case and connect USB board cable, Modem cable

2. Fix the below **screws**

M2.0x5.0 FLAT BIND screw x2

***NOTE**: Be careful not to catch the cables between cover assembly and base assembly.*

4.14 System board

CAUTION:	*1. when handling the system board, always hold by the edges. Do not touch the printed circuit face.* *2. if replacing with a new system board, execute the subtest01 Initial configuration in section 3.3 "Setting of the hardware configuration". Also update with the latest BIOS as described in Appendix G "BIOS Rewrite Procedures" and with the latest EC/KBC as described in Appendix H "EC/KBC Rewrite Procedures".*

Removing the system board

The following describes the procedure for removing the system board.

1. Disconnect the power cable from the system board (See Figure 4-25)

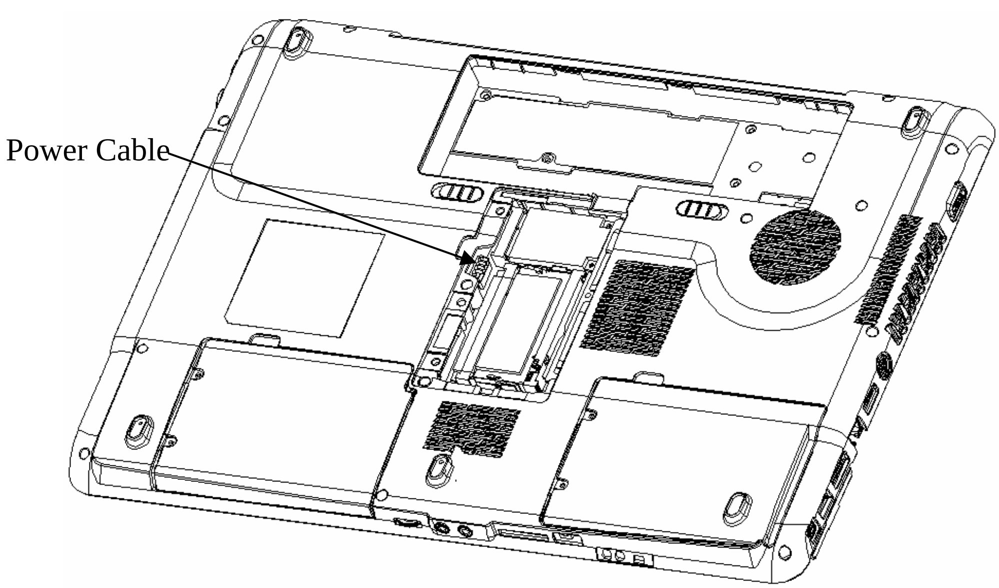


Figure 4-23 Disconnect the power cable

2. Disconnect the **speaker cable, USB cable, FM CABLE, MDC CABLE and BLUETOOTH CABLE** from the connector on the system board.

3. Remove the following **screws** securing the system board and remove the **system board**. (See Figure 4-26)

   - M2.5×5.0 BIND screw x4

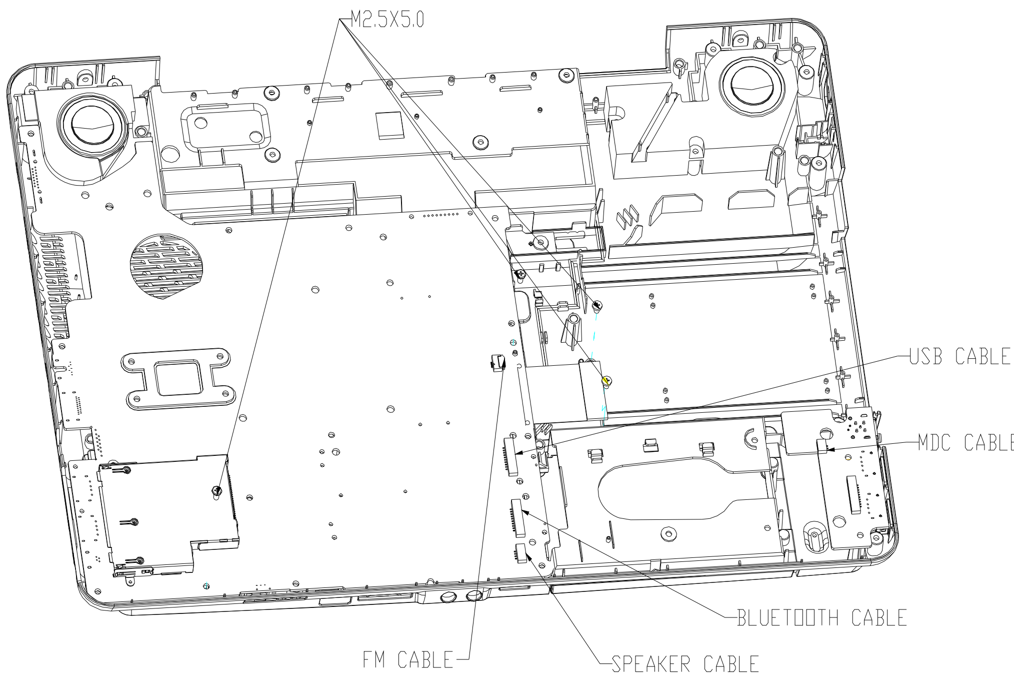


Figure 4-24 Remove the system board

Installing the system board

The following describes the procedure for installing the system board (See Figure 4-26).

1. Secure the system board with the following **screws**.
    - M2.5×5.0 BIND screw x4
2. Connect the **speaker cable, USB cable, FM CABLE, MDC CABLE and BLUETOOTH CABLE** to the connector on the system board.
3. Connect the power cable to the connector on the system board

4.15 CPU

Removing the CPU heat sink

The following describes the procedure for removing the CPU heat sink (See Figure 4-27).

1. Disconnect the **Heat sink cable** from the connector on the system board

2. Remove the following **screws** securing the heat sink holder along 1 to 6.

   - M2.5×5.0 BIND screw x8

> ***NOTE:*** *When removing the heat sink holder, be sure to remove the screws in the reverse order of the number marked on the holder.*

3. Remove the **CPU heat sink**.

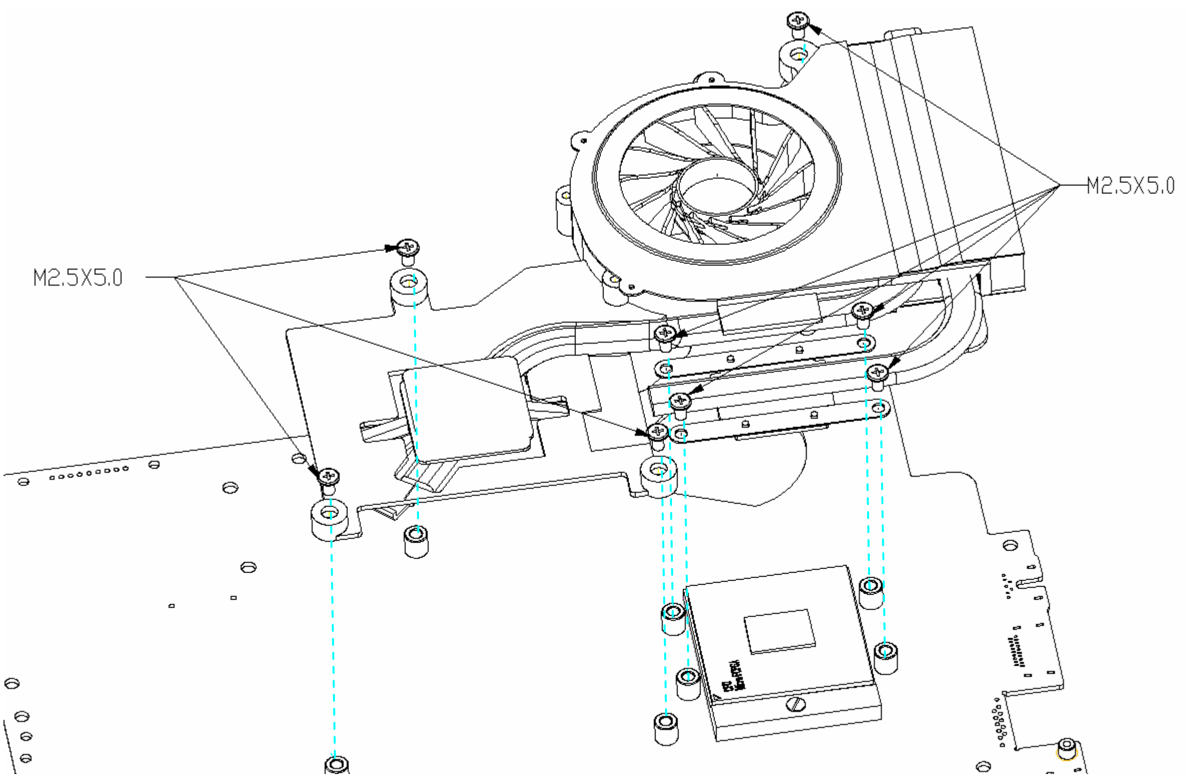


Figure 4-25 Remove the CPU heat sink

4. Unlock the **CPU** by rotating the **cam** on the CPU socket 120 degrees to the counterclockwise with a flat-blade screwdriver.

5. Remove the **CPU**.

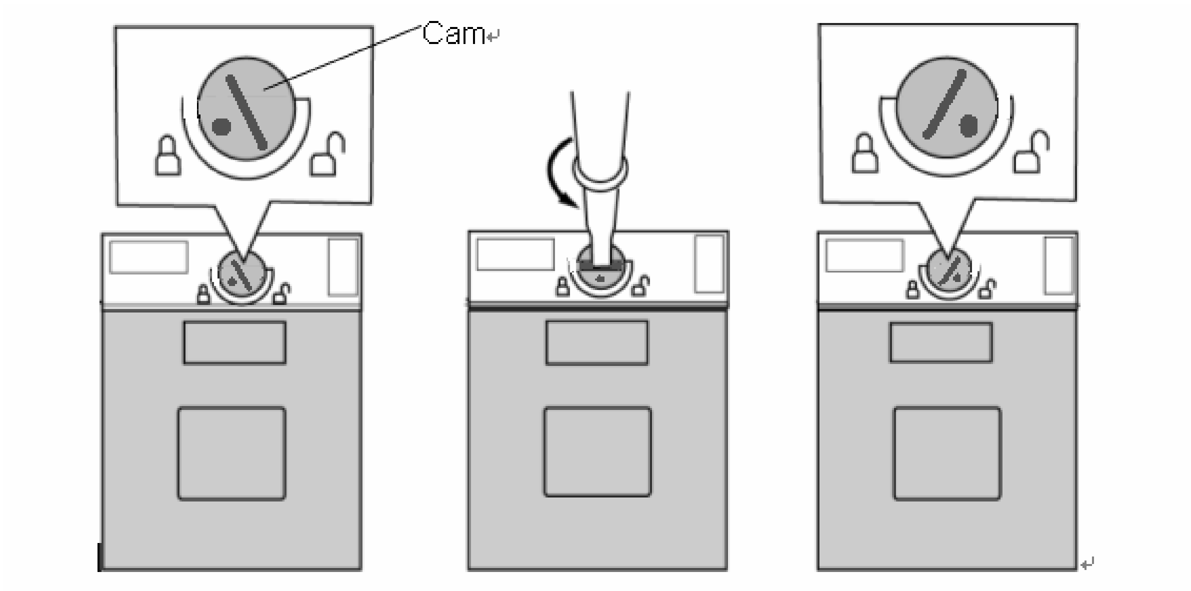


Figure 4-26 Remove the CPU

Installing the CPU

The following describes the procedure for installing the CPU (See Figure 4-27 to 4-28).

1. Check that the mark of cam is in the unlocking position.

2. Attach the **CPU** to the correct position in the **CPU socket**.

3. Fix the **CPU** by rotating the cam 120 degrees to the clockwise with a flat-blade screwdriver.

4. If there is already silicon grease on the CPU, clean it with a cloth.
   Using a special applicator, apply silicon grease so that the CPU chip on the CPU is completely covered.

5. Please apply 0.1cc silicon grease (Shinetsu 7762) for each repair. And apply

   Thermal pad for N-bridge, VGA&V-RAM for each repair

NOTE:	*Apply the silicon grease enough to cover the chip surface using the special applicator. Thermal pad is fixed for each one, no need special applicator.*

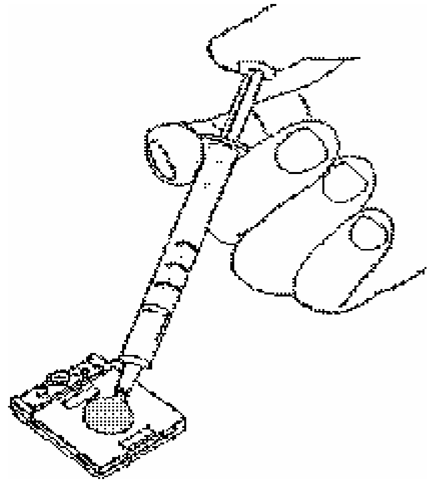


Figure 4-27 Apply silicon grease

6. Install the **CPU heat sink** and **heat sink holder** and secure them with the following **screws** along 1 to 6.

   M2.5×5.0BIND screw x8

7. Connect the **Heat sink cable** to the connector on the system board

NOTE:	*When securing the heat sink holder, be sure to secure the screws in the order of the number marked on the holder.*

4.16 LCD unit / FL inverter

CAUTION:	*When replacing a LCD, it is required that SVP parameter is set. Update with the latest EC/KBC as described in Appendix H "EC/KBC Rewrite Procedures".*

Removing the LCD unit / FL inverter

The following describes the procedure for removing the LCD unit and FL inverter (See Figure 4-30 to 4-33)

Remove Screw rubber cover X8

1. Remove the following **screws** securing the display mask

M2.5×5.0	BIND screw	X4
M2.5×4.0	BIND screw	X4

2. Insert your finger between the edge of the display mask and the **LCD**, and remove the **display mask** while releasing the latches of display mask.

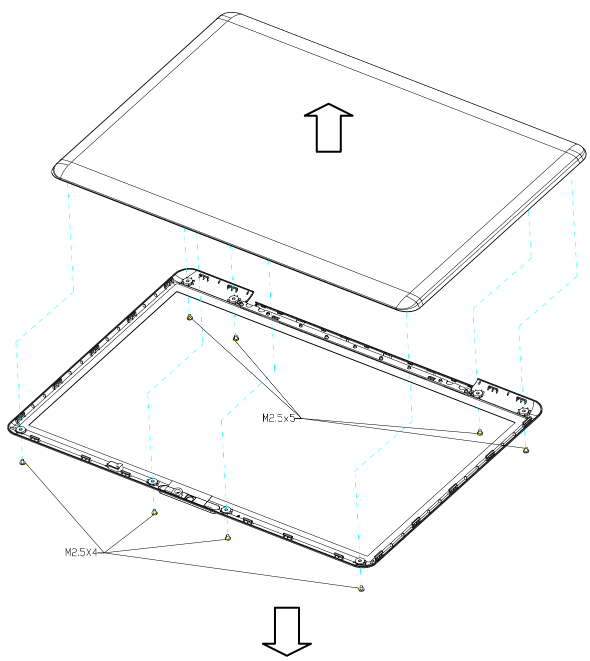


Figure 4-28   Remove the display mask

3. Pull out one **insulator** and peel off the other one adhered to the FL inverter.
4. Disconnect the **LCD harnesses** from the connectors **CN1** on the FL inverter.
5. Disconnect the **HV harnesses** from the connectors **CN2** on the FL inverter.
6. Remove the **FL inverter** while peeling off the **double-sided tape**.

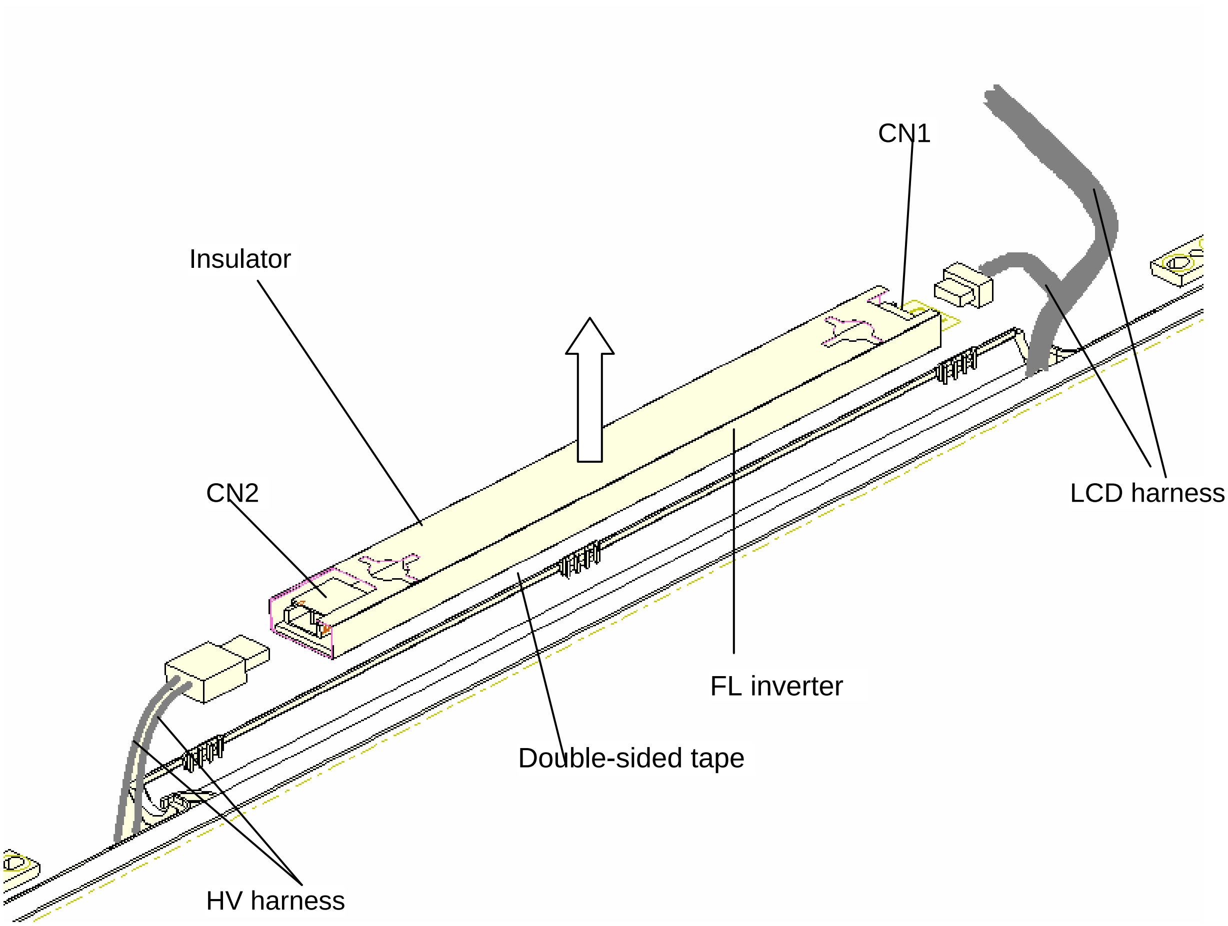


Figure 4-29 Remove the FL inverter

7. Remove the following **screws** securing the LCD unit.

   - M2.5x5.0 BINK HEAD screw x4

8. With the bottom edge of the LCD unit on the display cover, lift only the top edge of the LCD unit. After peeling off the **CONDUTIVE tape**, disconnect the LCD harness from the connector on the back of the LCD.

9. Remove the **LCD unit**.

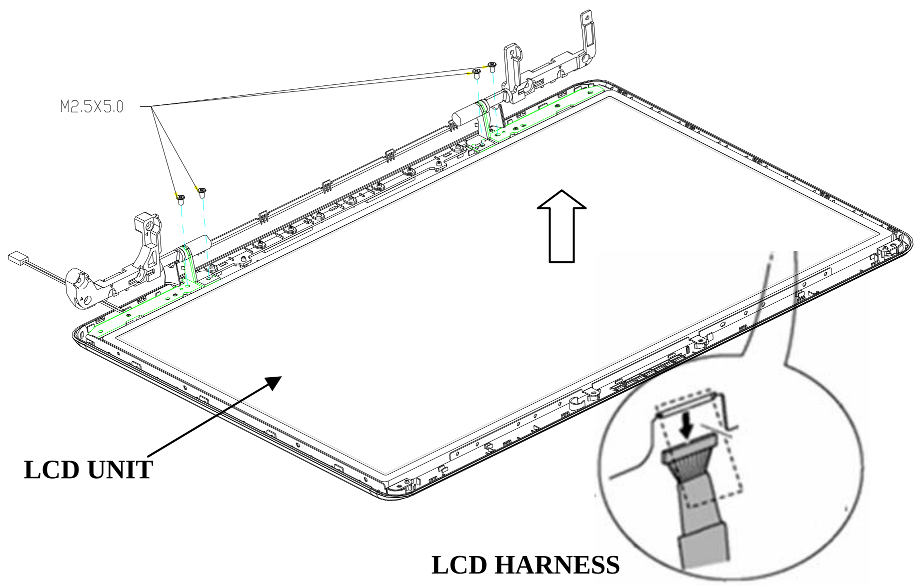


Figure 4-30 Remove the LCD unit

10. Remove the following **screws** securing the LCD support (LCD unit side) and remove the **LCD supports and LCD top bracket** from the LCD unit.

  - M2.0x2.5 BINK screw x6

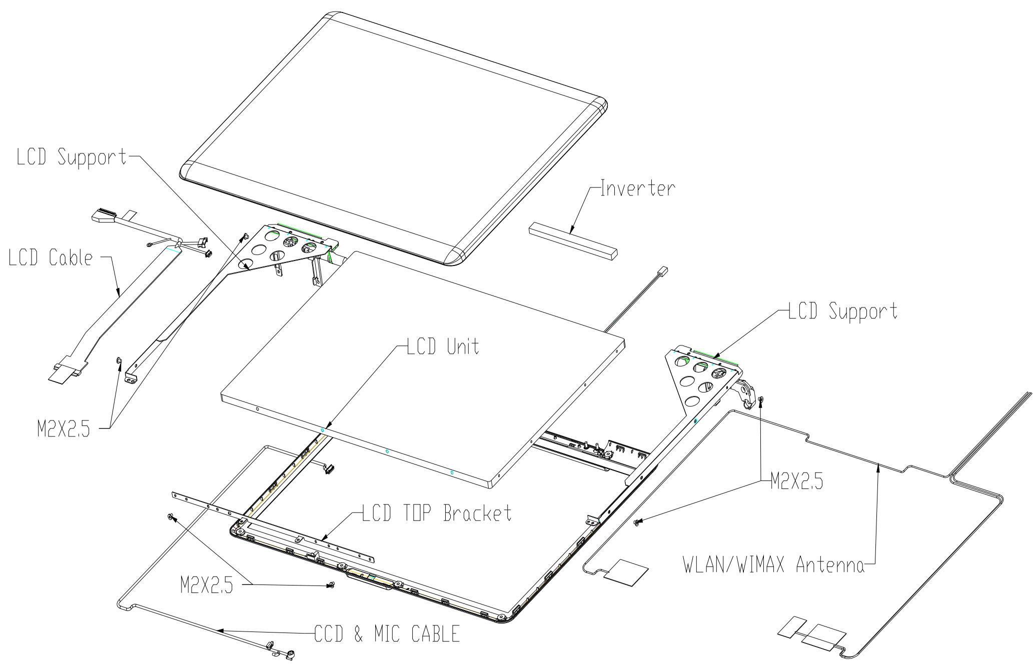


Figure 4-31 Remove the LCD supports

Installing the LCD unit/FL Inverter

The following describes the procedure for installing the LCD unit and FL inverter (See Figure 4-31 to 4-34).

1. Install the LCD supports (LCD unit side) and LCD top bracket to the LCD and secure them with the following **screws**.

    - M2.0×2.5 BINK screw x6

2. Stand the **LCD unit** on the display cover and connect the **LCD harness** to the connector on the back of LCD.

3. Stick the **conductive tape** on the connector of LCD harness.

4. Secure the LCD unit with the following **screws**.

    - M2.5×5.0 BINK screw x4

5. Connect **LCD harnesses** to the connector **CN1** of the FL inverter.

CAUTION: *Be careful not to connect the LCD harnesses to the wrong connectors of FL inverter.*

6. Connect **HV harnesses** to the connector **CN2** of the FL inverter.

7. Install the **display mask** while fitting the latches.

8. Secure the display mask with following **screws**

    M2.5×5.0 BIND screw X8

9. Cover screws with Screw rubber cover X8

NOTE: *When installing the display mask, make sure there is no gap between the display mask and the display cover.*

4.17 Application for Grease (Denka FCR-AS)/Thermal pad on North Bridge, VGA,V-RAM

I. For Satellite P300, Satellite Pro P300, EQUIUM P300, SATEGO P300(Intel without VGA Board) use Thermal pad on North Bridge

TSB PN	RW PN	Used on
A000032180	JXBL5016010	N-BRIDGE THERMAL PAD BL5(JXBL5016,3A)

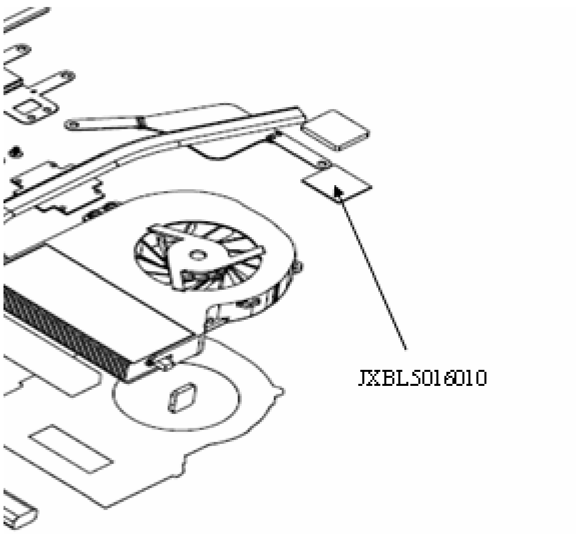


Figure 4-32 Thermal pad on North Bridge

II. For Satellite P300, Satellite Pro P300, EQUIUM P300, SATEGO P300(INT with VGA board) use Denka FCR-AS (A000018310) grease on North Bridge, and used Thermal pad on VGA, VRAM1,VRAM2,VRAM3,VRAM4.

1. Denka FCR-AS: A000018310
2. 0.15cc for one repair
3. one Syringe contains 1cc of Denka FCR-AS grease

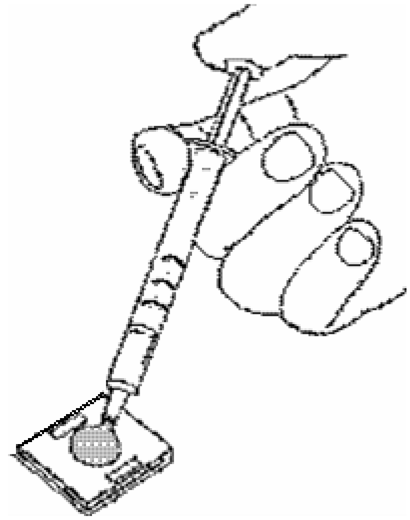


Figure 4-33 Apply silicon grease for North Bridge

4. Thermal pad used on VGA, VRAM1, VRAM2, VRAM3, VRAM4.

TSB PN	RW PN	Used on
A000032190	JXBL5017010	VGA THERMAL PAD BL5(JXBL5017,REV3A)
A000032200	JXBL5018010	VRAM1 THERMAL PAD BL5(JXBL5018,REV3A)
A000032210	JXBL5019010	VRAM2 THERMAL PAD BL5(JXBL5019,REV3A)
A000032220	JXBL5020010	VRAM3 THERMAL PAD BL5(JXBL5020,REV3A)
A000032230	JXBL5021010	VRAM4 THERMAL PAD BL5(JXBL5021,REV3A)

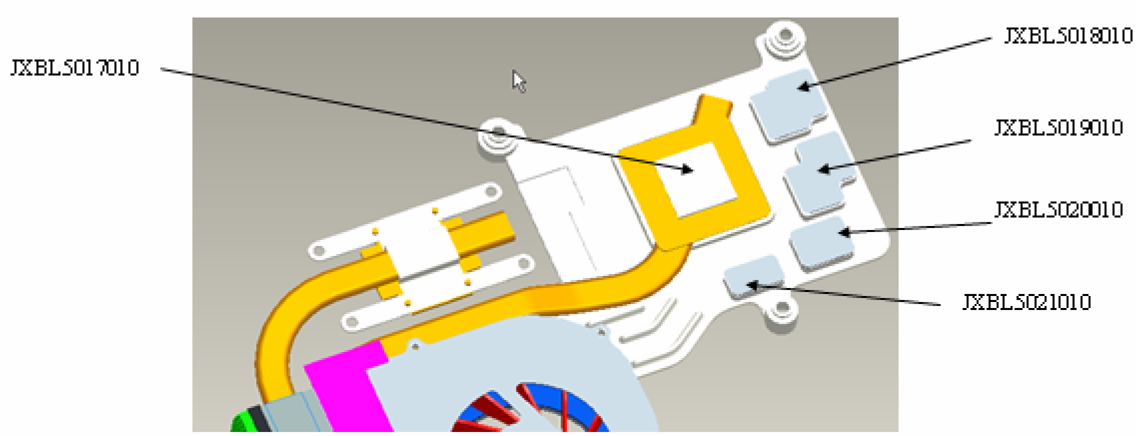


Figure 4-34 Thermal pad & VRAM position

III. For Satellite P300D, Satellite Pro P300D, EQUIUM P300D, SATEGO P300D (AMD without VGA Board) use the thermal pad only on North Bridge.

TSB PN	RW PN	Used on
A000037540	JXBD3027010	UMA NB PAD FSL-BS BD3A(JXBD3027,3A)

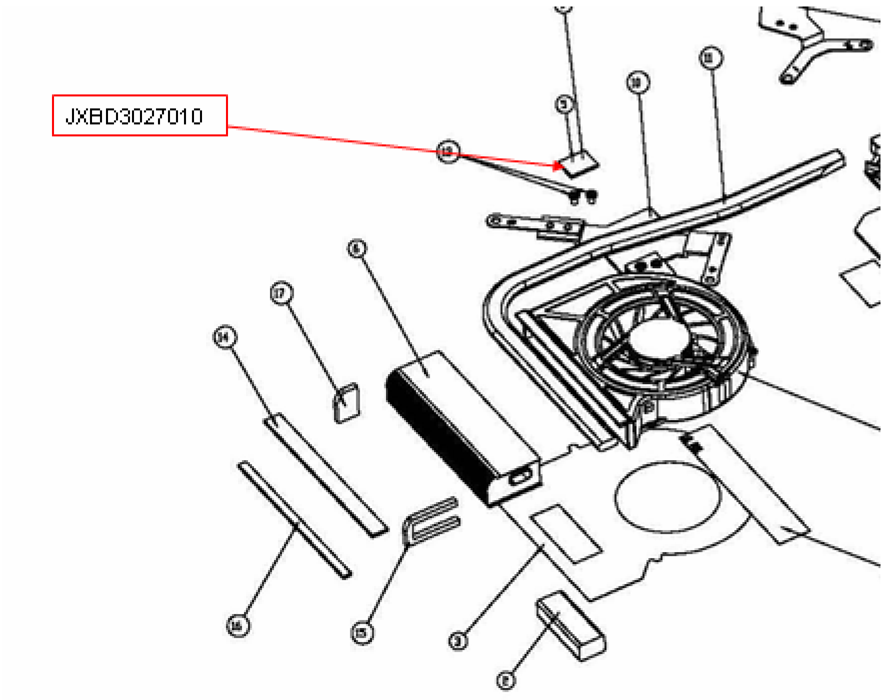


Figure 4-37 Thermal pad position

IV. For Satellite P300D, Satellite Pro P300D, EQUIUM P300D, SATEGO P300D (AMD with VGA board) use the thermal pad on North Bridge, VGA, VRAM1, VRAM2, VRAM3, VRAM4 (part number is under application)

TSB PN	RW PN	Used on
A000037550	JXBD3028010	DIS NB PAD FSL-BS BD3A(JXBD3028,3A)
A000037560	JXBD3029010	DIS VGA PAD 50H BD3A(JXBD3029,3A)
A000037570	JXBD3030010	DIS VRAM PAD1 T-FLEX340BD3A(JXBD3030,3A)
A000037580	JXBD3031010	DIS VRAM PAD2 T-FLEX340BD3A(JXBD3031,3A)
A000037590	JXBD3032010	DIS VRAM PAD3 T-FLEX340BD3A(JXBD3032,3A)
A000037600	JXBD3033010	DIS VRAM PAD4 T-FLEX340BD3A(JXBD3033,3A)

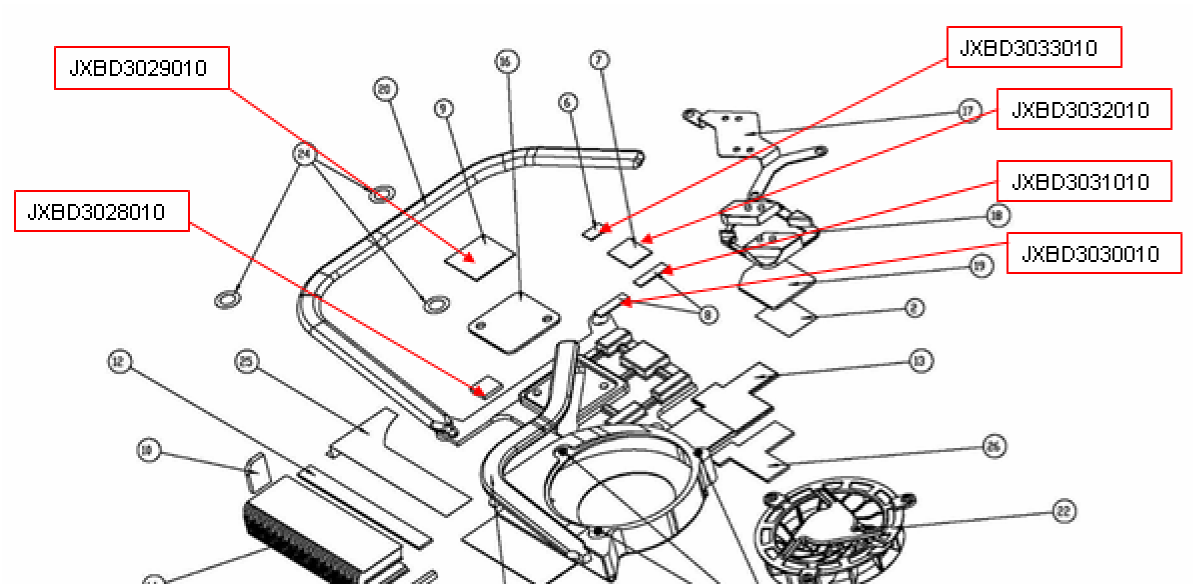


Figure 4-38   Thermal pad & VRAM position

> ***NOTE:*** *When applying for grease on North Bridge, one syringe*1cc can cover about seven repairs. Thermal pad is fixed for each one, no need special applicator and can re-use.*

Appendices

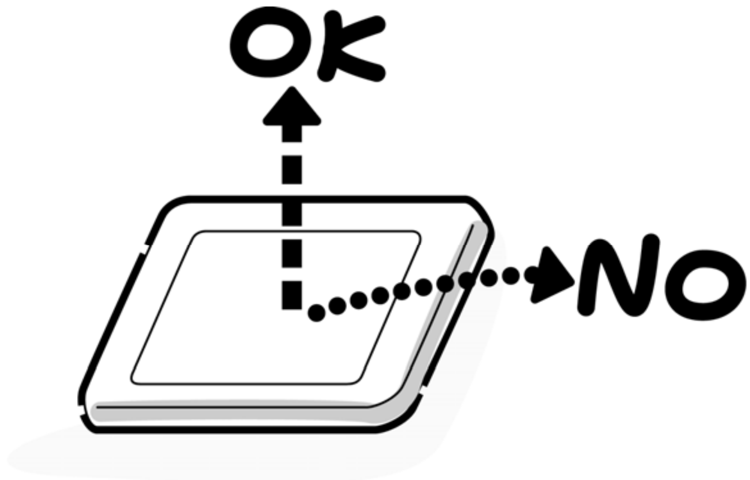
Appendix Contents

Appendix A Handling the LCD Module

Precautions for handling the LCD module

The LCD module can be easily damaged during assembly or disassembly. Observe the following precautions when handling the LCD module:

1. When installing the LCD module in the LCD cover, be sure to seat it so that it is properly aligned and maximum visibility of the display is maintained.



2. Be careful to align the holes at the four corners of the LCD module with the corresponding holes in the LCD cover before securing the module with screws. Do not force the module into place, because stress can affect its performance.

   Also, the panel's polarized surface is easily scarred, so be careful when handling it.





3. If the panel’s surface gets dirty, wipe it with cotton or a soft cloth. If it is still dirty, try breathing on the surface to create a light condensate and wipe it again.

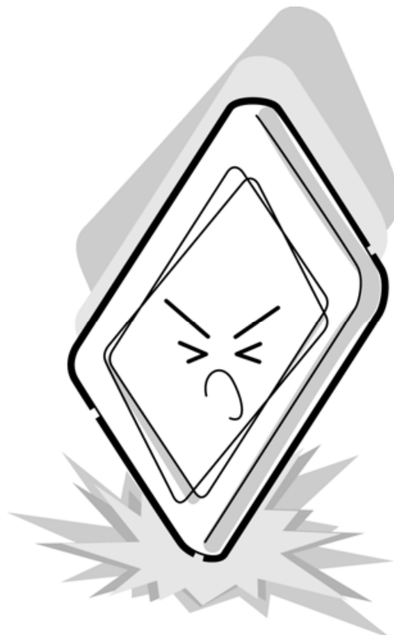
   If the surface is very dirty, we recommend a CRT cleaning agent. Apply the agent to a cloth and then wipe the panel’s surface. Do not apply cleanser directly to the panel.



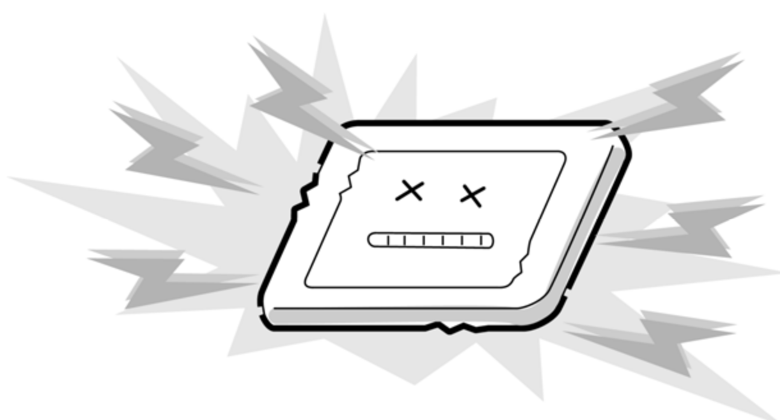
4. If water or other liquid is left on the panel’s surface for a long period, it can change the screen’s tint or stain it. Be sure to quickly wipe off any liquid.



5. Glass is used in the panel, so be careful not to drop it or let it strike a hard object, which could cause breakage or cracks.



6. CMOS-LSI circuits are used in the module, so guard against damage from electrostatic discharge. Be sure to wear a wrist or ankle ground when handling the module.



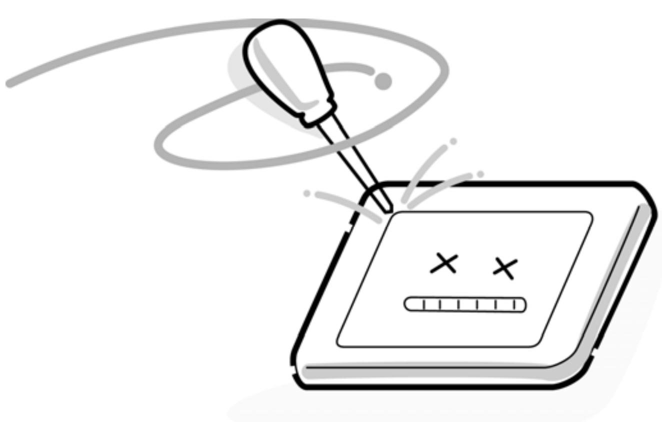
7. Do not expose the module directly to sunlight or strong ultraviolet rays for long periods.



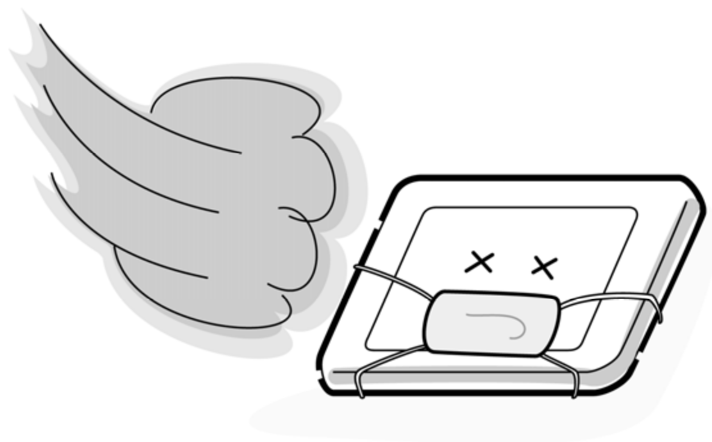
8. Do not store the module at temperatures below specifications. Cold can cause the liquid crystals to freeze, lose their elasticity or otherwise suffer damage.



9. Do not disassemble the LCD module. Disassembly can cause malfunctions.



10. If you transport the module, do not use packing material which contains epoxy resin (amine) or silicon glue (alcohol or oxide). These materials can release gas that can damage the panel's polarization.



Appendix B Board Layout

B.1 System Board

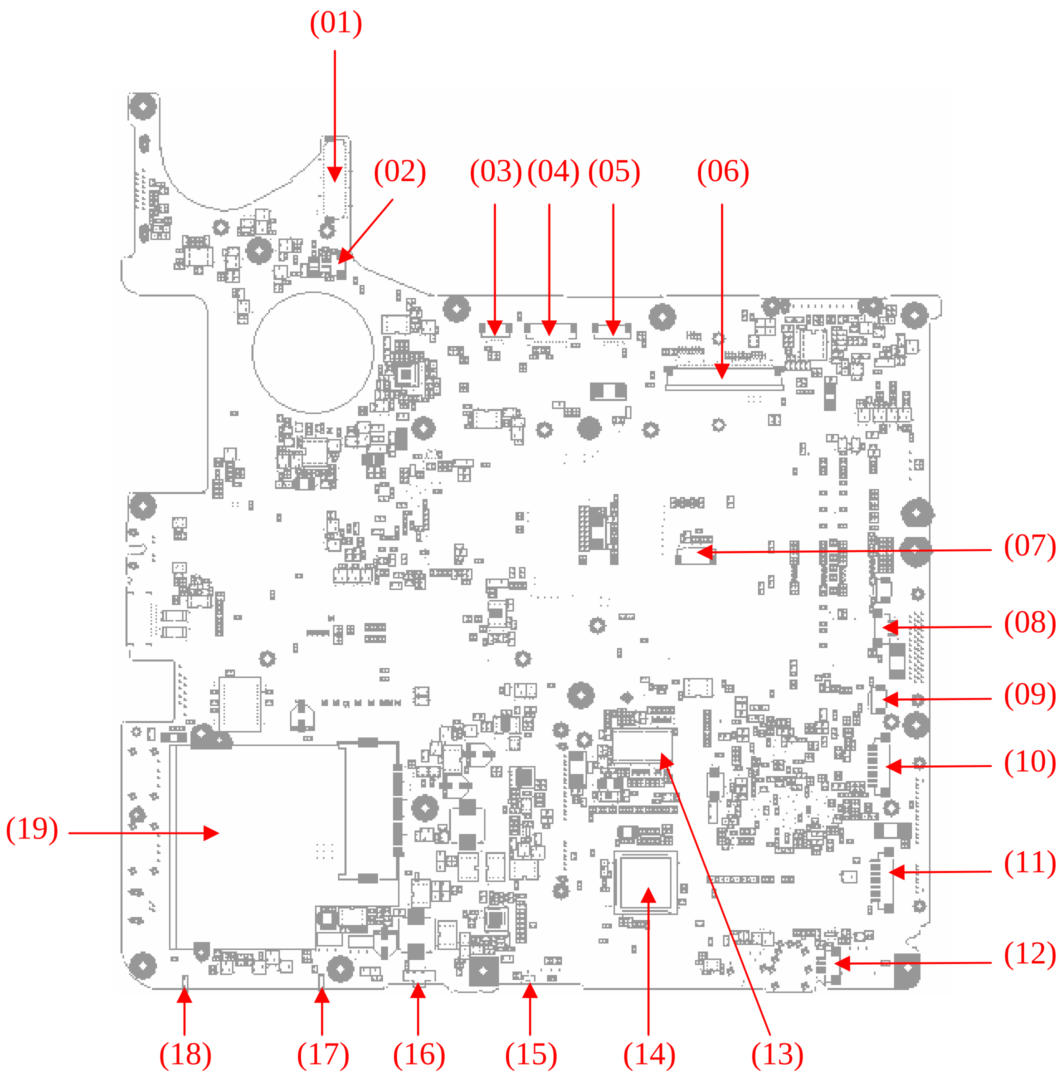


Figure B-1 System board layout (front)

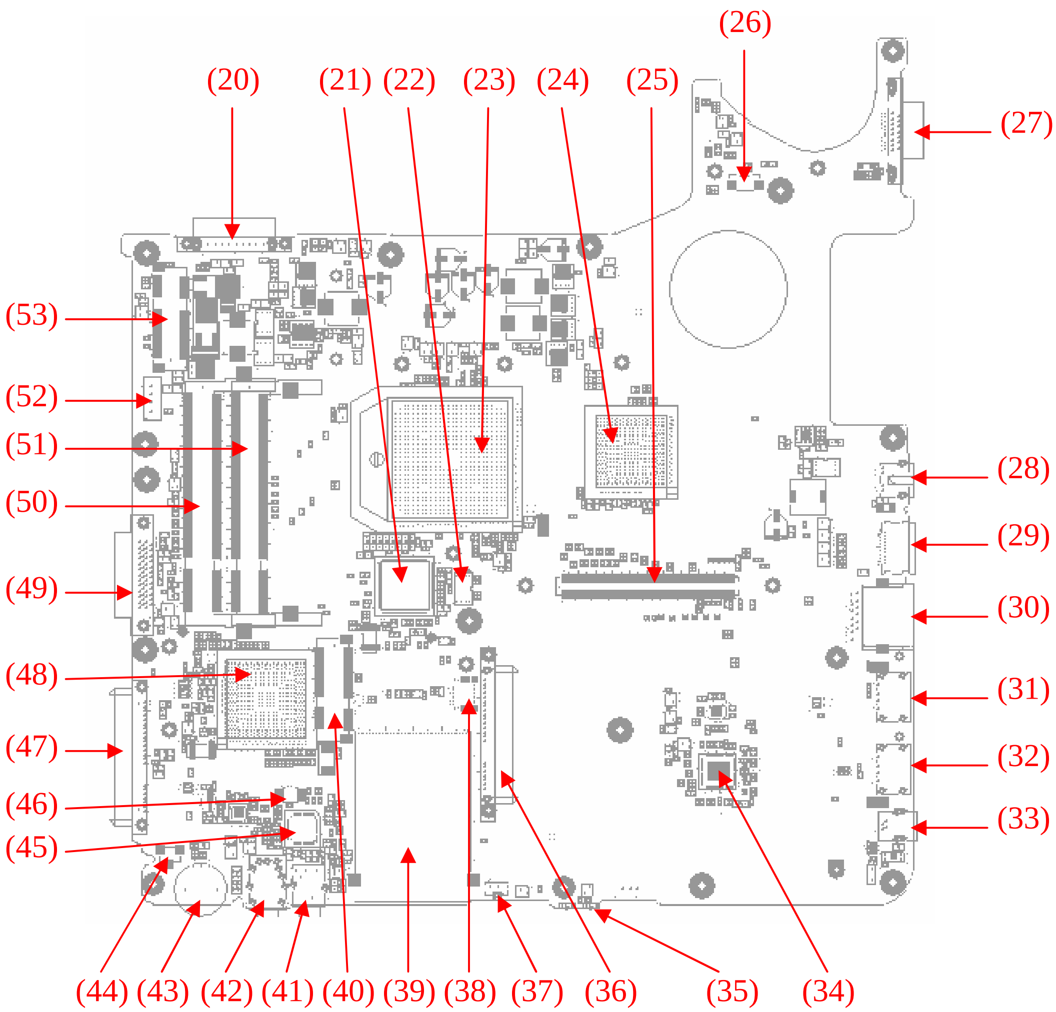


Figure B-2 System board layout (Back)

Table B-1 System board ICs and connectors

	Location	Function
(01)	CN4	M/B to panel connector
(02)	CN5	Internal MIC cable connector
(03)	CN8	M/B to Power Switch Board connector
(04)	CN6	M/B to Low Cost Function Board connector
(05)	CN7	M/B to MMB connector
(06)	CN9/CN10	M/B to Keyboard connector
(07)	CN11	M/B to Touchpad Board connector
(08)	CN13	M/B to Touchpad Board connector
(09)	CN42	M/B to FM connector
(10)	CN16	M/B to USB Board connector
(11)	CN14	M/B to Bluetooth module connector
(12)	CN17	M/B to Speaker connector
(13)	U17	Clock Generator
(14)	U20	Card Reader and 1394 Combo controller IC O_2 OZ129TN
(15)	MR4	Hall IC
(16)	SW4	Kill Switch
(17)	LED6	Logo LED
(18)	LED5	Logo LED
(19)	CN15	New Card connector
(20)	CN20	Battery connector
(21)	U26	Embedded Controller IC Winbond WPCE775
(22)	U27	BIOS IC
(23)	U25	CPU
(24)	U24	North Bridge
(25)	CN27	M/B to External VGA Board connector
(26)	CN19	FAN connector
(27)	CN18	CRT connector
(28)	CN22	S-Video connector
(29)	CN25	HDMI connector
(30)	CN28	RJ-45 connector
(31)	CN31	USB connector
(32)	CN35	USB connector
(33)	CN38	1394 connector
(34)	U35	LAN controller IC Marvell 88E8040T(10/100) / 88E8072(Giga)
(35)	LED8	WLAN and BT Combo LED
(36)	CN32	2nd SATA connector
(37)	U41	CIR Sensor
(38)	CN43	M/B to MDC module connector

(39)	CN33	Card Reader connector
(40)	CN30	HD DVD Decoder Module Slot
(41)	CN41	External MIC Jack
(42)	CN40	Headphone and SPDIF Combo Jack
(43)	VR4	Volume Regulator
(44)	CN39	Internal MIC cable connector
(45)	U38	Azalia Audio Codec Conexant CX20561-12Z
(46)	CN37	RTC Battery connector
(47)	CN34	1st SATA connector
(48)	U32	South Bridge
(49)	CN26	PATA ODD connector
(50)	CN23	DDR SO-DIMM Slot B
(51)	CN24	DDR SO-DIMM Slot A
(52)	PCN4	ACIN cable connector
(53)	CN21	WLAN Module Slot

B.2 MMB board

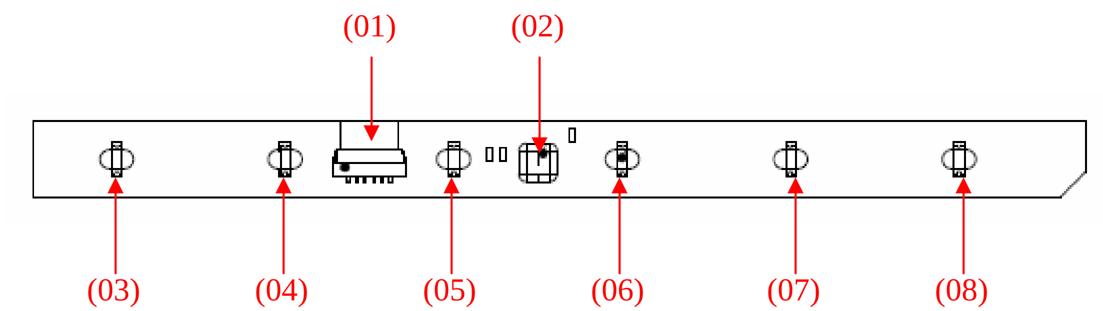


Figure B-3 MMB board layout (back)

Table B-2 MMB board IC and connectors

	Location	Function
(01)	J1	Connect to M/B connector
(02)	U1	Sensor IC Quantum QT1081
(03)	D1	Music Mute Button
(04)	D2	Media Player Button
(05)	D3	Music Play / Pause Button
(06)	D4	Music Stop Button
(07)	D5	Music Backward
(08)	D6	Music Forward

B.3 Low Cost Function board

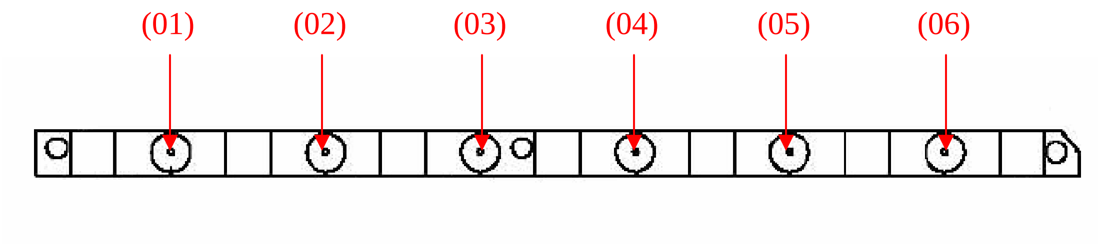


Figure B-4 Low Cost Function board layout (front)

Table B-3 Low Cost Function board connectors

	Location	Function
(01)	SW1	Music Mute Button
(02)	SW2	Media Player Button
(03)	SW3	Music Play / Pause Button
(04)	SW4	Music Stop Button
(05)	SW5	Music Backward
(06)	SW6	Music Forward

B.4 USB with RJ11 board

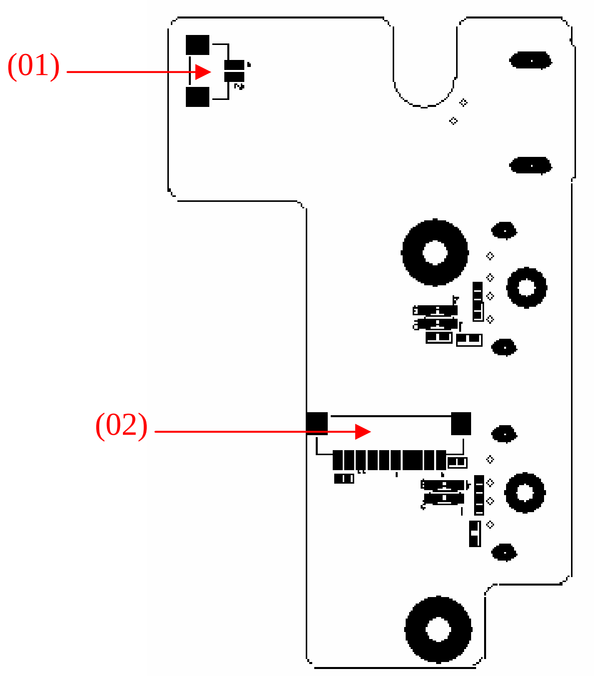


Figure B-5 USB with RJ11 board layout (front)

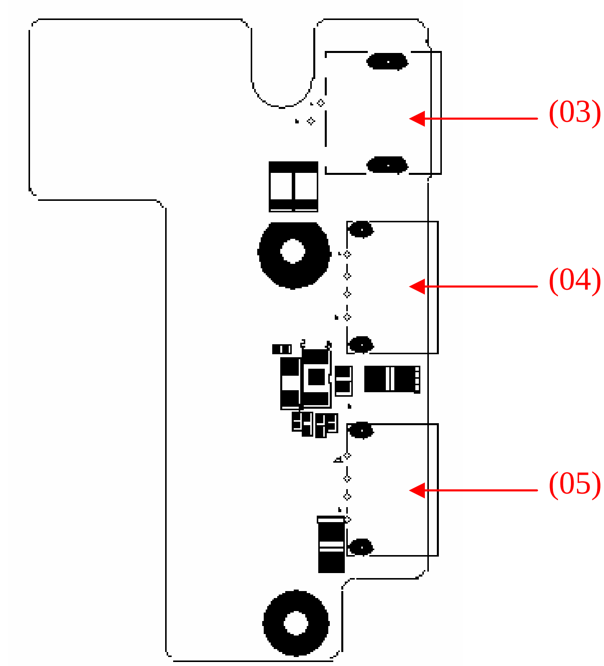


Figure B-6 USB with RJ11 board layout (back)

Table B-4 USB with RJ11 board connectors

	Location	Function
(01)	CN2	Connect to Modem module
(02)	CN3	Connect to M/B USB connector
(03)	CN1	RJ11 connector
(04)	CN4	USB connector
(05)	CN5	USB connector

B.5 USB with FM Board

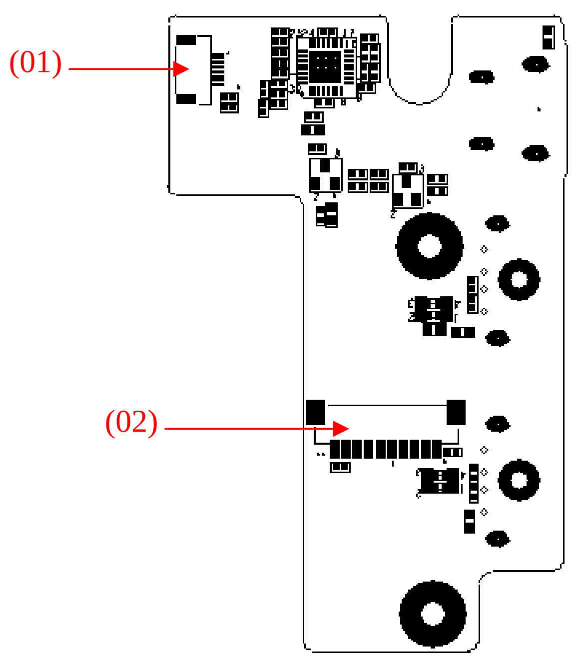


Figure B-7 USB with FM board layout (front)

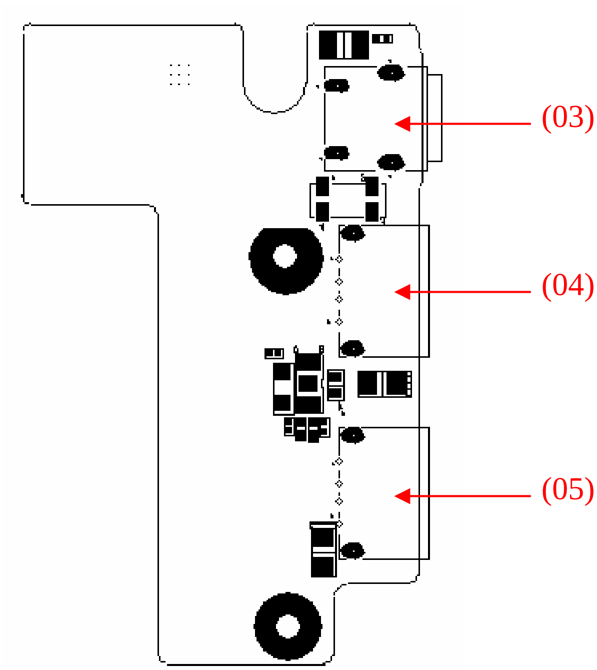


Figure B-8 USB with FM board layout (back)

Table B-5 USB with FM board connectors

	Location	Function
(01)	CN7	Connect to M/B FM connector
(02)	CN3	Connect to M/B USB connector
(03)	CN8	FM Jack
(04)	CN4	USB connector
(05)	CN5	USB connector

B.6 Touch Pad Board

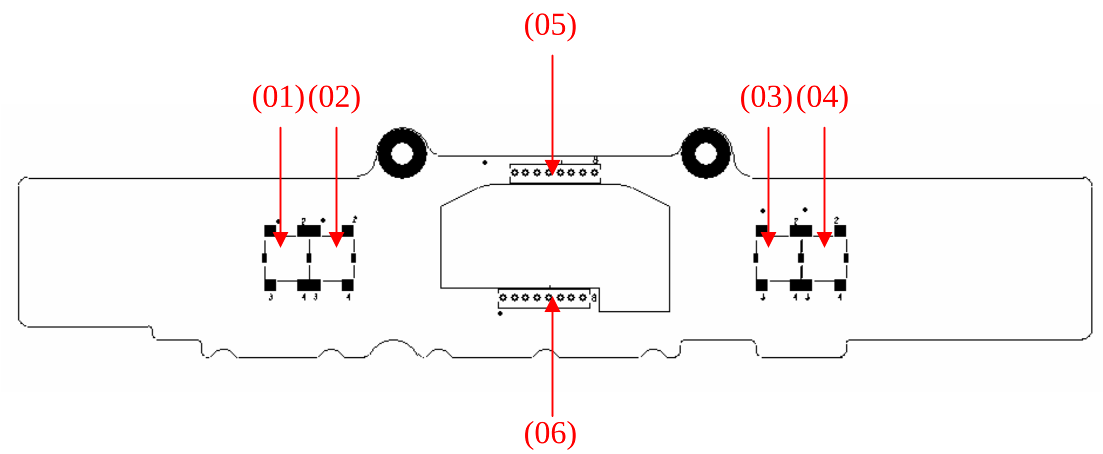


Figure B-9 Touch pad board layout (front)

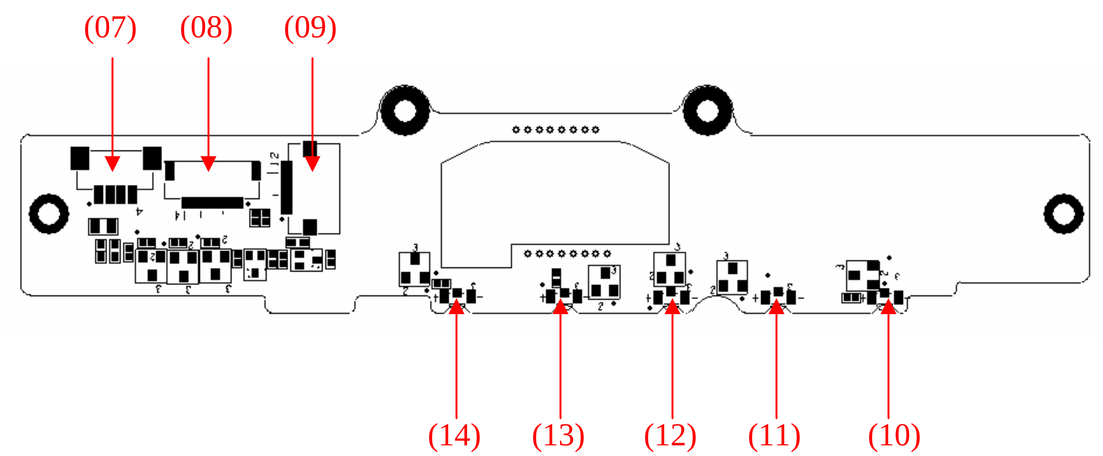


Figure B-10 Touch pad board layout (back)

Table B-6 Touch pad board connectors

	Location	Function
(01)	SW1	Mouse Button Left key
(02)	SW3	Mouse Button Left key
(03)	SW4	Mouse Button Right key
(04)	SW2	Mouse Button Right key
(05)	CN2	TP board to FP board connector
(06)	CN3	TP board to FP board connector
(07)	CN1	TP board to M/B USB signal connector
(08)	CN4	TP board to M/B USB signal connector
(09)	CN5	TP Board to TP module connector
(10)	LED4	ACIN LED
(11)	LED1	Power and Suspend LED
(12)	LED2	Battery Charge LED
(13)	LED3	HDD LED
(14)	LED5	Card Reader LED

B.7 Power Switch Board

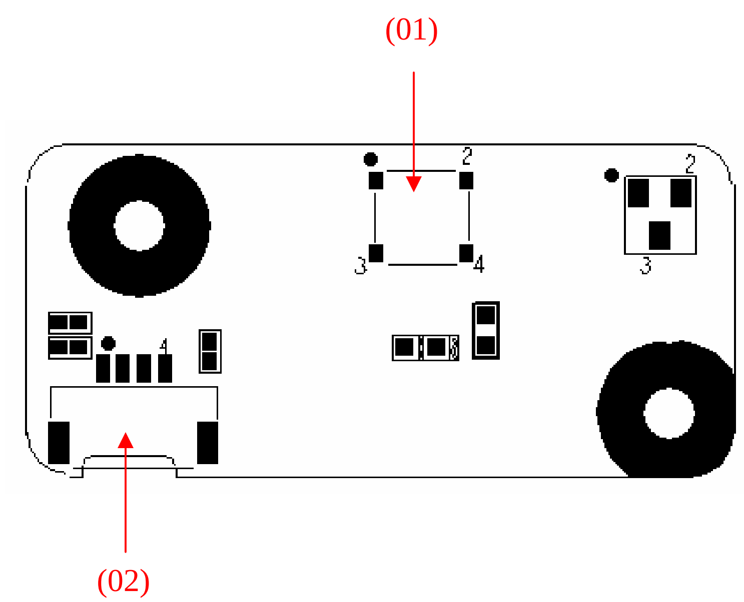


Figure B-11 Power Switch board layout (front)

Table B-7 Power Switch board connectors

	Location	Function
(01)	SW1	Power Button
(02)	CN14	Power Switch Board to M/B connector

B.8 Fingerprint Board

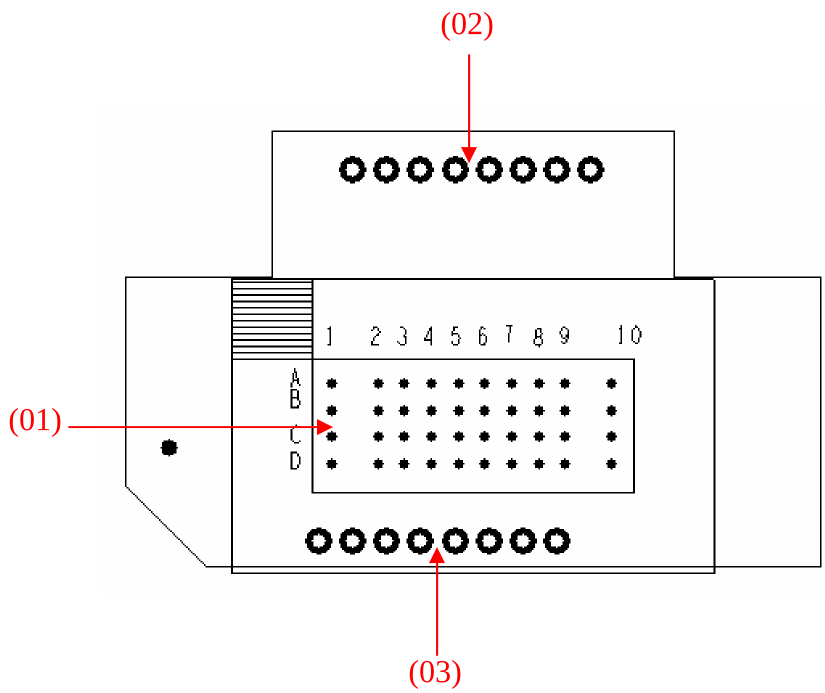


Figure B-12 Fingerprint board layout (front)

Table B-8 Fingerprint board IC and connectors

	Location	Function
(01)	U1	Finger Printer IC Authentec AES1610
(02)	CN2	FP board to TP board connector
(03)	CN3	FP board to TP board connector

B.9 Modem Board

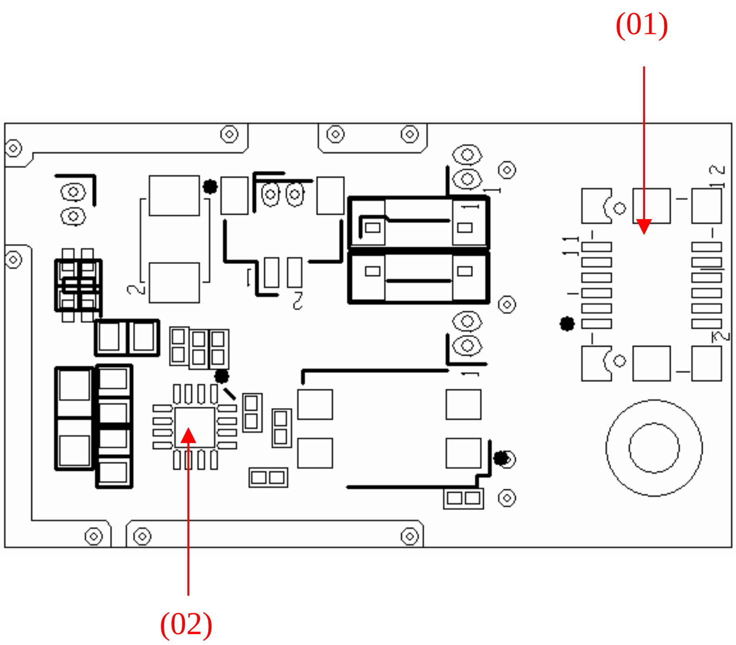


Figure B-13 Modem board layout (front)

Table B-9 Modem board IC and connectors

	Location	Function
(01)	CN1	Modem board to M/B board connector
(02)	MU1	Modem IC Conexant CX20548-11Z

Appendix C Pin Assignment

CN4 LCD TYPE CONNECTOR

CONN SMD WAFER 40P 2R MS(P1.0,H3.9)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	INVCC0	---	2	LCD_VCC	---
3	INVCC0	---	4	LCD_VCC	---
5	INVCC0	---	6	LCD_EDIDDATA	I/O
7	+3V	---	8	LCD_EDIDCLK	I/O
9	CCD_POWER	---	10	LCD_VADJ	I
11	MIC_GND_R	---	12	GND	---
13	Analog MIC_R	---	14	CCD_USBP2+	I/O
15	DISPON	O	16	CCD_USBP2-	I/O
17	GND	---	18	GND	---
19	TXLCLKOUT+	I/O	20	TXUCLKOUT+	I/O
21	TXLCLKOUT-	I/O	22	TXUCLKOUT-	I/O
23	GND	---	24	GND	---
25	TXLOUT0+	I/O	26	TXUOUT0+	I/O
27	TXLOUT0-	I/O	28	TXUOUT0-	I/O
29	GND	---	30	GND	---
31	TXLOUT1+	I/O	32	TXUOUT1+	I/O
33	TXLOUT1-	I/O	34	TXUOUT1-	I/O
35	GND	---	36	GND	---
37	TXLOUT2+	I/O	38	TXUOUT2+	I/O

39	TXLOUT2-	I/O	40	TXUOUT2-	I/O
41	GND	---	42	GND	---

CN5 INTMIC Connector1

CONN SMD HEADER 2P 1R MR(P1.25,H1.9)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	MIC_GND	---	2	Analog MIC	---

CN6 Low cost MMB Connector

CONN SMD FPC 10P 1R FR(P1.0,H1.5)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	+3VPCU	---	2	MX5	I
3	MX2	I	4	MY1	I
5	GND	---	6	MX3	I
7	LOW_DET	I	8	MX4	I
9	FN0#	I	10	FN1#	I

CN7 Main stream MMB Connector

CONN SMD FPC 6P 1R FR(P1.0,H1.5)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	+3VPCU	---	2	+5VPCU	---
3	KEY_INT	I	4	GND	---
5	3ND_MBDATA	I/O	6	3ND_MBCLK	I/O

CN8 Power board Connector

CONN SMD FFC 4P 1R FR (P1.0,H1.5)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	+5VPCU	---	2	NBSWON#	I
3	PWRLED#	I	4	GND	---

CN9 Keyboard Side Connector

CONN SMD FFC 34P,1R,FR(P0.8,H2.0)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	K_LED_P	I	2	MY16	I
3	NC	---	4	MY17	I
5	NC	---	6	K_LED_P	I
7	MY2	I	8	MY1	I
9	MY0	I	10	MY4	I
11	MY3	I	12	MY5	I
13	MY14	I	14	MY6	I

15	MY7	I	16	MY13	I
17	MY8	I	18	MY9	I
19	MY10	I	20	MY11	I
21	MY12	I	22	MY15	I
23	MX7	I	24	MX2	I
25	MX3	I	26	MX4	I
27	MX0	I	28	MX5	I
29	MX6	I	30	MX1	I
31	K_LED_P	I	32	CAPSLED	I
33	FN_F10	I	34	NUMLED	I

CN11 T/P Connector

CONN SMD FFC 14P 1R FR(P0.5,H1.5)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	+5V_TP	---	2	+5VPCU	---
3	TPDATA_1	I/O	4	TPCLK_1	I/O
5	GND	---	6	GND	---
7	TP_LED_ON_C	O	8	BATLED1#	O
9	BATLED0#	O	10	PWRLED#	O
11	SUSLED_EC	O	12	IDE_LED#	O
13	ACIN	O	14	TP_XD_LED	O

CN12 Felica Connector

CONN SMD FPC 6P 1R FR(P0.5,H1.5)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	FELICA_POWER	---	2	USBP5-_C	I/O
3	USBP5+_C	I/O	4	GND	---
5	NC	---	6	FELICA_DE	---

CN13 Finger Printer CONNECTOR

CONN SMD HEADER 4P 1R MR(P1.25,H1.9)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	FINGER_POWER	---	2	USBP4-_C	I/O
3	USBP4+_C	I/O	4	GND	---

CN14 BLUETOOTH MODULE CONNECTOR

CONN SMD HEADER 10P 1R MR(P1.25,H1.9)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	GND	---	2	BT_USBP8+_C	I/O
3	BT_USBP8-_C	I/O	4	WCS_CLK	O
5	GND	---	6	BT_RESET	I
7	WCS_DAT	I	8	+3V	---
9	USB_DETACH	I	10	GND	---

CN15 New card Connector

CONN SMD HEADER 26P 1R MR (P1.0,H5.4)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	GND	O	2	USBP6-_R	I/O
3	USBP6+_R	I/O	4	CPUSB#	I
5	T84	---	---	T89	---
7	NEW_SMCLK	I/O	8	NEW_SMDATA	I/O
9	+NEW_1.5V	---	10	+NEW_1.5V	---
11	PCIE_WAKE#	O	12	+NEW_3VAUX	---
13	PERST#	O	14	+NEW_3V	---
15	+NEW_3V	---	16	NEW Card_CLKREQ#	O
17	CPPE#	I	18	CLK_PCIE_NEW#	O
19	CLK_PCIE_NEW	O	20	GND	---
21	GPP_RX3N_NEWCARD	I/O	22	GPP_RX3P_NEWCARD	I/O
23	GND	---	24	GPP_TX3N_NEWCARD	I/O
25	GPP_TX3P_NEWCARD	I/O	26	GND	---

CN16 USB(Daughter Board side) Connector

CONN SMD HEADER 10P 1R MR(P1.25,H1.9)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	+5VPCU	---	2	USB_OC2#	I
3	GND	---	4	USBP9+_C	I/O
5	USBP9-_C	I/O	6	USBP1+_C	I/O
7	USBP1-_C	I/O	8	GND	---
9	USB_EN2#	O	10	+5VPCU	---

CN17 INT SPEAKER Connector

CONN SMD HEADER 4P 1R MR(P1.25,H1.9)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	INSPKL-N	---	2	INSPKL+N	---
3	INSPKR-N	---	4	INSPKR+N	---

CN18 CRT PORT Connector

CONN DIP D-SUB 15P 2R FR(H12.5,P0.76)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	CRT_R1	O	2	CRT_G1	O
3	CRT_B1	O	4	NC	---
5	GND	---	6	GND	---
7	GND	---	8	GND	---
9	5V_CRT2	---	10	GND	---
11	T174	---	12	CRTDDAT	I/O
13	CRTHSYNC	O	14	CRTVSYNC	O
15	CRTDCLK	I/O			

CN19 CPU FAN Connector

CONN SMD WAFER,3P,1R,MS(P1.25,H4.7)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	TH_FAN_POWER_R	---	2	GND	---
3	FANSIG	I/O			

CN20 Battery Connector

CONN DIP BATT 9P 1R MR(P2.0,H6.5)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	MBAT+	---	2	MBAT+	---
3	ID_L	O	4	B/I	O
5	TEMP_MBAT	---	6	MBDATA	I/O
7	MBCLK	I/O	8	GND	---
9	GND	---			

CN21 MINI-Card I (WLAN) Connector

CONN SMD HEADER,52P,2R,MS(P0.8,H9)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	WLAN_WAKE#	O	2	+3V_WL_VDD	---
3	WCS_DATR	---	4	GND	---
5	WCS_CLKR	---	6	+1.5V	---
7	CLKREQ_WLAN#	O	8	NC	---
9	GND	---	10	NC	---
11	CLK_PCIE_WLAN#	I	12	NC	---
13	CLK_PCIE_WLAN	I	14	NC	---
15	GND	---	16	NC	---
17	NC	---	18	GND	---
19	NC	---	20	RF_EN_WLAN	I
21	GND	---	22	PLTRST#	I
23	GPP_RX1N_WLAN	O	24	+3V_WL_VDD	---
25	GPP_RX1P_WLAN	O	26	GND	---
27	GND	---	28	+1.5V	---

29	GND	---	30	WL_SMCLK_WLAN	I/O
31	GPP_TX1N_WLAN	I	32	WL_SMDATA_WLAN	I/O
33	GPP_TX1P_WLAN	I	34	GND	---
35	GND	---	36	USBP3-_C	I/O
37	NC	---	38	USBP3+_C	I/O
39	+3V_WL_VDD	---	40	GND	---
41	+3V_WL_VDD	---	42	WiMAX_LED#_A	---
43	GND	---	44	NC	---
45	NC	---	46	NC	---
47	NC	---	48	+1.5V	---
49	NC	---	50	GND	---
51	NC	O	52	+3V_WL_VDD	---

CN22 TVOUT Connector

CONN DIP MINI-DIN 4P FR(P1.0,H10.5)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	GND	---	2	GND	---
3	TV-LUMA	O	4	TV-CHROMA	O
5	GND	---	6	GND	---

CN23 DDRII SODIMM Connector1

DDR2 SO-DIMM(200P,H10.1,RVS)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	MVREF_DIM	---	2	GND	---
3	GND	---	4	M_B_DQ5	I/O
5	M_B_DQ4	I/O	6	M_B_DQ0	I/O
7	M_B_DQ1	I/O	8	GND	---
9	GND	---	10	M_B_DM0	I
11	M_B_DQS#0	I/O	12	GND	---
13	M_B_DQS0	I/O	14	M_B_DQ6	I/O
15	GND	---	16	M_B_DQ7	I/O
17	M_B_DQ2	I/O	18	GND	---
19	M_B_DQ3	I/O	20	M_B_DQ12	I/O
21	GND	---	22	M_B_DQ13	I/O
23	M_B_DQ8	I/O	24	GND	---
25	M_B_DQ9	I/O	26	M_B_DM1	I
27	GND	---	28	GND	---
29	M_B_DQS#1	I/O	30	M_CLKOUT3	I
31	M_B_DQS1	I/O	32	M_CLKOUT3#	I
33	GND	---	34	GND	---
35	M_B_DQ10	I/O	36	M_B_DQ14	I/O
37	M_B_DQ15	I/O	38	M_B_DQ11	I/O
39	GND	---	40	GND	---
41	GND	---	42	GND	---
43	M_B_DQ16	I/O	44	M_B_DQ20	I/O
45	M_B_DQ21	I/O	46	M_B_DQ17	I/O

47	GND	---	48	GND	---
49	M_B_DQS#2	I/O	50	T59	---
51	M_B_DQS2	I/O	52	M_B_DM2	I
53	GND	---	54	GND	---
55	M_B_DQ19	I/O	56	M_B_DQ18	I/O
57	M_B_DQ23	I/O	58	M_B_DQ22	I/O
59	GND	---	60	GND	---
61	M_B_DQ29	I/O	62	M_B_DQ24	I/O
63	M_B_DQ28	I/O	64	M_B_DQ25	I/O
65	GND	---	66	GND	---
67	M_B_DM3	I	68	M_B_DQS#3	I/O
69	T57	---	70	M_B_DQS3	I/O
71	GND	---	72	GND	---
73	M_B_DQ26	I/O	74	M_B_DQ30	I/O
75	M_B_DQ27	I/O	76	M_B_DQ31	I/O
77	GND	---	78	GND	---
79	M_CKE2	I	80	M_CKE3	I
81	+1.8VSUS	---	82	+1.8VSUS	---
83	M_B_CS#2	---	84	M_B_A15	---
85	M_B_BS#2	I	86	M_B_A14	---
87	+1.8VSUS	---	88	+1.8VSUS	---
89	M_B_A12	I/O	90	M_B_A11	I/O
91	M_B_A9	I/O	92	M_B_A7	I/O
93	M_B_A8	I/O	94	M_B_A6	I/O

95	+1.8VSUS	---	96	+1.8VSUS	---
97	M_B_A5	I/O	98	M_B_A4	I/O
99	M_B_A3	I/O	100	M_B_A2	I/O
101	M_B_A1	I/O	102	M_B_A0	I/O
103	+1.8VSUS	---	104	+1.8VSUS	---
105	M_B_A10	I/O	106	M_B_BS#1	I
107	M_B_BS#0	I	108	M_B_RAS#	I
109	M_B_WE#	I	110	M_B_CS#0	I
111	+1.8VSUS	---	112	+1.8VSUS	---
113	M_B_CAS#	I	114	M_ODT2	I
115	M_B_CS#1	I	116	M_B_A13	I/O
117	+1.8VSUS	---	118	+1.8VSUS	---
119	M_ODT3	I	120	M_B_CS#3	---
121	GND	---	122	GND	---
123	M_B_DQ32	I/O	124	M_B_DQ33	I/O
125	M_B_DQ36	I/O	126	M_B_DQ37	I/O
127	GND	---	128	GND	---
129	M_B_DQS#4	I/O	130	M_B_DM4	I
131	M_B_DQS4	I/O	132	GND	---
133	GND	---	134	M_B_DQ34	I/O
135	M_B_DQ39	I/O	136	M_B_DQ38	I/O
137	M_B_DQ35	I/O	138	GND	---
139	GND	---	140	M_B_DQ44	I/O
141	M_B_DQ40	I/O	142	M_B_DQ45	I/O

143	M_B_DQ41	I/O	144	GND	---
145	GND	---	146	M_B_DQS#5	I/O
147	M_B_DM5	I	148	M_B_DQS5	I/O
149	GND	---	150	GND	---
151	M_B_DQ46	I/O	152	M_B_DQ47	I/O
153	M_B_DQ43	I/O	154	M_B_DQ42	I/O
155	GND	---	156	GND	---
157	M_B_DQ53	I/O	158	M_B_DQ48	I/O
159	M_B_DQ49	I/O	160	M_B_DQ52	I/O
161	GND	---	162	GND	---
163	T29	---	164	M_CLKOUT4	I
165	GND	---	166	M_CLKOUT4#	I
167	M_B_DQS#6	I/O	168	GND	---
169	M_B_DQS6	I/O	170	M_B_DM6	I
171	GND	---	172	GND	---
173	M_B_DQ55	I/O	174	M_B_DQ50	I/O
175	M_B_DQ54	I/O	176	M_B_DQ51	I/O
177	GND	---	178	GND	---
179	M_B_DQ60	I/O	180	M_B_DQ61	I/O
181	M_B_DQ57	I/O	182	M_B_DQ56	I/O
183	GND	---	184	GND	---
185	M_B_DM7	I	186	M_B_DQS#7	I/O
187	GND	---	188	M_B_DQS7	I/O
189	M_B_DQ62	I/O	190	GND	---

191	M_B_DQ59	I/O	192	M_B_DQ63	I/O
193	GND	---	194	M_B_DQ58	I/O
195	DDRDAT_SMB	I/O	196	GND	---
197	DDRCLK_SMB	I/O	198	SA0_B	---
199	+3V	---	200	SA1_B	---

CN24 DDRII SODIMM Connector2

DDR2 SO-DIMM(200P,H5.6,RVS)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	MVREF_DIM	---	2	GND	---
3	GND	---	4	M_A_DQ0	I/O
5	M_A_DQ1	I/O	6	M_A_DQ4	I/O
7	M_A_DQ5	I/O	8	GND	---
9	GND	---	10	M_A_DM0	I
11	M_A_DQS#0	I/O	12	GND	---
13	M_A_DQS0	I/O	14	M_A_DQ7	I/O
15	GND	---	16	M_A_DQ6	I/O
17	M_A_DQ2	I/O	18	GND	---
19	M_A_DQ3	I/O	20	M_A_DQ13	I/O
21	GND	---	22	M_A_DQ9	I/O
23	M_A_DQ12	I/O	24	GND	---
25	M_A_DQ8	I/O	26	M_A_DM1	I
27	GND	---	28	GND	---
29	M_A_DQS#1	I/O	30	M_CLKOUT0	I

31	M_A_DQS1	I/O	32	M_CLKOUT0#	I
33	GND	---	34	GND	---
35	M_A_DQ10	I/O	36	M_A_DQ15	I/O
37	M_A_DQ14	I/O	38	M_A_DQ11	I/O
39	GND	---	40	GND	---
41	GND	---	42	GND	---
43	M_A_DQ21	I/O	44	M_A_DQ20	I/O
45	M_A_DQ17	I/O	46	M_A_DQ19	I/O
47	GND	---	48	GND	---
49	M_A_DQS#2	I/O	50	T58	---
51	M_A_DQS2	I/O	52	M_A_DM2	I
53	GND	---	54	GND	---
55	M_A_DQ23	I/O	56	M_A_DQ22	I/O
57	M_A_DQ18	I/O	58	M_A_DQ16	I/O
59	GND	---	60	GND	---
61	M_A_DQ29	I/O	62	M_A_DQ25	I/O
63	M_A_DQ28	I/O	64	M_A_DQ24	I/O
65	GND	---	66	GND	---
67	M_A_DM3	I	68	M_A_DQS#3	I/O
69	T137	---	70	M_A_DQS3	I/O
71	GND	---	72	GND	---
73	M_A_DQ31	I/O	74	M_A_DQ27	I/O
75	M_A_DQ26	I/O	76	M_A_DQ30	I/O
77	GND	---	78	GND	---

79	M_CKE0	I	80	M_CKE1	I
81	+1.8VSUS	---	82	+1.8VSUS	---
83	M_A_CS#2	---	84	M_A_A15	---
85	M_A_BS#2	I	86	M_A_A14	---
87	+1.8VSUS	---	88	+1.8VSUS	---
89	M_A_A12	I/O	90	M_A_A11	I/O
91	M_A_A9	I/O	92	M_A_A7	I/O
93	M_A_A8	I/O	94	M_A_A6	I/O
95	+1.8VSUS	---	96	+1.8VSUS	---
97	M_A_A5	I/O	98	M_A_A4	I/O
99	M_A_A3	I/O	100	M_A_A2	I/O
101	M_A_A1	I/O	102	M_A_A0	I/O
103	+1.8VSUS	---	104	+1.8VSUS	---
105	M_A_A10	I/O	106	M_A_BS#1	I
107	M_A_BS#0	I	108	M_A_RAS#	I
109	M_A_WE#	I	110	M_A_CS#0	I
111	+1.8VSUS	---	112	+1.8VSUS	---
113	M_A_CAS#	I	114	M_ODT0	I
115	M_A_CS#1	I	116	M_A_A13	I/O
117	+1.8VSUS	---	118	+1.8VSUS	---
119	M_ODT1	I	120	M_A_CS#3	---
121	GND	---	122	GND	---
123	M_A_DQ32	I/O	124	M_A_DQ33	I/O
125	M_A_DQ36	I/O	126	M_A_DQ38	I/O

127	GND	---	128	GND	---
129	M_A_DQS#4	I/O	130	M_A_DM4	I
131	M_A_DQS4	I/O	132	GND	---
133	GND	---	134	M_A_DQ34	I/O
135	M_A_DQ37	I/O	136	M_A_DQ39	I/O
137	M_A_DQ35	I/O	138	GND	---
139	GND	---	140	M_A_DQ44	I/O
141	M_A_DQ40	I/O	142	M_A_DQ45	I/O
143	M_A_DQ41	I/O	144	GND	---
145	GND	---	146	M_A_DQS#5	I/O
147	M_A_DM5	I	148	M_A_DQS5	I/O
149	GND	---	150	GND	---
151	M_A_DQ42	I/O	152	M_A_DQ43	I/O
153	M_A_DQ46	I/O	154	M_A_DQ47	I/O
155	GND	---	156	GND	---
157	M_A_DQ55	I/O	158	M_A_DQ53	I/O
159	M_A_DQ54	I/O	160	M_A_DQ48	I/O
161	GND	---	162	GND	---
163	T130	---	164	M_CLKOUT1	I
165	GND	---	166	M_CLKOUT1#	I
167	M_A_DQS#6	I/O	168	GND	---
169	M_A_DQS6	I/O	170	M_A_DM6	I
171	GND	---	172	GND	---
173	M_A_DQ50	I/O	174	M_A_DQ49	I/O

175	M_A_DQ51	I/O	176	M_A_DQ52	I/O
177	GND	---	178	GND	---
179	M_A_DQ56	I/O	180	M_A_DQ57	I/O
181	M_A_DQ60	I/O	182	M_A_DQ61	I/O
183	GND	---	184	GND	---
185	M_A_DM7	I	186	M_A_DQS#7	I/O
187	GND	---	188	M_A_DQS7	I/O
189	M_A_DQ59	I/O	190	GND	---
191	M_A_DQ58	I/O	192	M_A_DQ63	I/O
193	GND	---	194	M_A_DQ62	I/O
195	DDRDAT_SMB	I/O	196	GND	---
197	DDRCLK_SMB	I/O	198	SA0_A	---
199	+3V	---	200	SA1_A	---

CN25 HDMI Connector

CONN DIP HDMI HOUSING 19P 2R FR(H7.23)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	HDMITX2P_C	O	2	GND	---
3	HDMITX2N_C	O	4	HDMITX1P_C	O
5	GND	---	6	HDMITX1N_C	O

7	HDMITX0P_C	O	8	GND	---
9	HDMITX0N_C	O	10	HDMICLK+_C	O
11	GND	---	12	HDMICLK-_C	O
13	CEC	I/O	14	NC	---
15	HDMI_SCL	O	16	HDMI_SDA	O
17	GND	---	18	DDC5V	---
19	HDMI_HPD	I			---

CN26 ODD CONNECTOR

CONN DIP HOUSING 50P 2R FR(P0.8,H4.1)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	NC	---	2	NC	---
3	NC	---	4	GND	---
5	-IDERST	O	6	PDD8	I/O
7	PDD7	I/O	8	PDD9	I/O
9	PDD6	I/O	10	PDD10	I/O
11	PDD5	I/O	12	PDD11	I/O
13	PDD4	I/O	14	PDD12	I/O
15	PDD3	I/O	16	PDD13	I/O
17	PDD2	I/O	18	PDD14	I/O
19	PDD1	I/O	20	PDD15	I/O
21	PDD0	I/O	22	PDDREQ	O
23	GND	---	24	PDIOR#	I

25	PDIOW#	I	26	GND	---
27	PDIORDY	O	28	PDDACK#	I
29	IRQ14	O	30	NC	---
31	PDA1	I/O	32	DIAG#	---
33	PDA0	I/O	34	PDA2	I/O
35	PDCS1#	I	36	PDCS3#	O
37	ODD_LED#	O	38	+5V	---
39	+5V	---	40	+5V	---
41	+5V	---	42	+5V	---
43	GND	---	44	GND	---
45	GND	---	46	GND	---
47	GND	---	48	GND	---
49	NC	---	50	NC	---

CN27 MXM Connector

CONN SMD HOUSING 200P FS(P5.15,H8.65)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	PEG_RXN15	I	2	PEG_TXN15	O
3	PEG_RXP15	I	4	PEG_TXP15	O
5	GND	---	6	GND	---
7	PEG_RXN14	I	8	PEG_TXN14	O

9	PEG_RXP14	I	10	PEG_TXP14	O
11	GND	---	12	GND	---
13	PEG_RXN13	I	14	PEG_TXN13	O
15	PEG_RXP13	I	16	PEG_TXP13	O
17	GND	---	18	GND	---
19	PEG_RXN12	I	20	PEG_TXN12	O
21	PEG_RXP12	I	22	PEG_TXP12	O
23	GND	---	24	GND	---
25	PEG_RXN11	I	26	PEG_TXN11	O
27	PEG_RXP11	I	28	PEG_TXP11	O
29	GND	---	30	GND	---
31	PEG_RXN10	I	32	PEG_TXN10	O
33	PEG_RXP10	I	34	PEG_TXP10	O
35	GND	---	36	GND	---
37	PEG_RXN9	I	38	PEG_TXN9	O
39	PEG_RXP9	I	40	PEG_TXP9	O
41	GND	---	42	GND	---
43	PEG_RXN8	I	44	PEG_TXN8	O
45	PEG_RXP8	I	46	PEG_TXP8	O
47	GND	---	48	GND	---
49	PEG_RXN7	I	50	PEG_TXN7	O
51	PEG_RXP7	I	52	PEG_TXP7	O
53	GND	---	54	GND	---
55	PEG_RXN6	I	56	PEG_TXN6	O

57	PEG_RXP6	I	58	PEG_TXP6	O
59	GND	---	60	GND	---
61	PEG_RXN5	I	62	PEG_TXN5	O
63	PEG_RXP5	I	64	PEG_TXP5	O
65	GND	---	66	GND	---
67	PEG_RXN4	I	68	PEG_TXN4	O
69	PEG_RXP4	I	70	PEG_TXP4	O
71	GND	---	72	GND	---
73	PEG_RXN3	I	74	PEG_TXN3	O
75	PEG_RXP3	I	76	PEG_TXP3	O
77	GND	---	78	GND	---
79	PEG_RXN2	I	80	PEG_TXN2	O
81	PEG_RXP2	I	82	PEG_TXP2	O
83	GND	---	84	GND	---
85	PEG_RXN1	I	86	PEG_TXN1	O
87	PEG_RXP1	I	88	PEG_TXP1	O
89	GND	---	90	GND	---
91	PEG_RXN0	I	92	PEG_TXN0	O
93	PEG_RXP0	I	94	PEG_TXP0	O
95	GND	---	96	GND	---
97	MXM_REFCLKN	I	98	EXT_CRT_DDCCLK	I/O
99	MXM_REFCLKP	I	100	EXT_CRT_DDCDAT	I/O
101	GND	---	102	GND	---
103	PLTRST#	I	104	EXT_HDMI_DDCCLK	I/O

105	SYSFANON#	O	106	EXT_HDMI_DDCDAT	I/O
107	MAINON	I	108	GND	---
109	GFXPG	O	110	EXT_LVDS_PNLCLK	I/O
111	VGA_MBDATA	I/O	112	EXT_LVDS_PNLDAT	I/O
113	VGA_MBCLK	I/O	114	GND	---
115	EXT_LVDS_BLON	O	116	EXT_VGA_RED	O
117	EXT_DISP_ON	O	118	GND	---
119	DVI_HPD	I	120	EXT_VGA_GRN	O
121	GND	---	122	GND	---
123	EXT_HSYNC	O	124	EXT_VGA_BLU	O
125	EXT_VSYNC	O	126	GND	---
127	GND	---	128	EXT_LVDS_TXL#2	O
129	EXT_LVDS_TXU#2	O	130	EXT_LVDS_TXL2	O
131	EXT_LVDS_TXU2	O	132	GND	---
133	GND	---	134	EXT_LVDS_TXL#1	O
135	EXT_LVDS_TXU#1	O	136	EXT_LVDS_TXL1	O
137	EXT_LVDS_TXU1	O	138	GND	---
139	GND	---	140	EXT_LVDS_TXL#0	O
141	EXT_LVDS_TXU#0	O	142	EXT_LVDS_TXL0	O
143	EXT_LVDS_TXU0	O	144	GND	---
145	GND	---	146	EXT_LVDS_TXLCK#	O
147	EXT_LVDS_TXUCK#	O	148	EXT_LVDS_TXLCK	O
149	EXT_LVDS_TXUCK	O	150	GND	---
151	GND	---	152	EXT_TV_C/R	O

153	GND	---	154	GND	---
155	GND	---	156	EXT_TV_Y/G	O
157	GND	---	158	GND	---
159	GND	---	160	EXT_TV_COMP	O
161	NC	---	162	GND	---
163	+5V	---	164	EXT_HDMICLK-	O
165	+5V	---	166	EXT_HDMICLK+	O
167	NC	---	168	GND	---
169	GND	---	170	EXT_HDMITX2N	O
171	NC	---	172	EXT_HDMITX2P	O
173	+3V	---	174	GND	---
175	+3V	---	176	EXT_HDMITX1N	O
177	+3V	---	178	EXT_HDMITX1P	O
179	+3V	---	180	GND	---
181	+3V	---	182	EXT_HDMITX0N	O
183	NC	---	184	EXT_HDMITX0P	O
185	GND	---	186	GND	---
187	NC	---	188	NC	---
189	VIN	---	190	VIN	---
191	VIN	---	192	VIN	---
193	VIN	---	194	VIN	---
195	VIN	---	196	VIN	---
197	VIN	---	198	VIN	---
199	VIN	---	200	VIN	---

CN28 RJ45 Connector

CONN DIP RJ45 12P 2P FR(H8.0)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	X-TX0P	I/O	2	X-TX0N	I/O
3	X-TX1P	I/O	4	X-TX2P	I/O
5	X-TX2N	I/O	6	X-TX1N	I/O
7	X-TX3P	I/O	8	X-TX3N	I/O
9	LAN_VCC4	---	10	LAN_LINKLED#	---
11	LAN_VCC3	---	12	LAN_ACTLED#	---

CN30 MINI-Card II (HD Decoder) Connector

CONN SMD HEADER 52P 2R MS(P0.8,H8)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	NC	---	2	+3V_HD_VDD	---
3	NC	---	4	GND	---
5	NC	---	6	+1.5V	---
7	NC	---	8	LAD0_PCIE	I/O
9	GND	---	10	LAD1_PCIE	I/O
11	CLK_PCIE_MINICARD#	I	12	LAD2_PCIE	I/O

13	CLK_PCIE_MINICARD	I	14	LAD3_PCIE	I/O
15	GND	---	16	LFRAME#_PCIE	I
17	NC	---	18	GND	---
19	NC	---	20	RF_EN_WLAN	I
21	GND	---	22	PLTRST#	I
23	GPP_RX2N_MINICARD	O	24	+3V_HD_VDD	---
25	GPP_RX2P_MINICARD	O	26	GND	I
27	GND	---	28	+1.5V	---
29	GND	---	30	MINI2_SMCLK	I/O
31	GPP_TX2N_MINICARD	I	32	MINI2_SMDATA	I/O
33	GPP_TX2P_MINICARD	I	34	GND	---
35	GND	---	36	NC	---
37	GND	---	38	NC	---
39	NC	---	40	GND	---
41	NC	---	42	NC	---
43	GND	---	44	NC	---
45	PCLK_DBC_R	---	46	NC	---
47	PCIRST#_R	---	48	+1.5V	---
49	NC	---	50	GND	---
51	NC	---	52	+3V_HD_VDD	---

CN31 USB Connector

CONN DIP USB HOUSING 4P 1R FR(H7.6)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O

1	USBPWR0	---	2	BUSBP7-	I/O
3	BUSBP7+	I/O	4	GND	---

CN32 2'nd SATA HDD Connector

CONN DIP HOUSING 22P 1R FR(P1.27,H4.0)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	GND	---	2	SATA_TXP1	I
3	SATA_TXN1	I	4	GND	
5	SATA_RXN1_C	O	6	SATA_RXP1_C	O
7	GND	---	8	+3.3VSATA2	---
9	+3.3VSATA2	---	10	+3.3VSATA2	---
11	GND	---	12	GND	---
13	GND	---	14	+5V	---
15	+5V	---	16	+5V	---
17	GND	---	18	NC	---
19	GND	---	20	NC	---
21	NC	---	22	NC	---

CN33 5 IN 1 CARD READER Connector

CONN SMD HOUSING 43P FR(P0.82,H7.05)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	GND	---	2	XD_CD#_C	O
3	XD_R/B#_C	I	4	XD_RE#_C	I/O

5	XD_CE#_C	I	6	XD_CLE_C	O
7	XD_ALE_C	I	8	XD_WE#_C	I
9	SD_D2_C	I/O	10	XD_WPO#_C	O
11	GND	---	12	SD_D3_C	I/O
13	VCC_XD	---	14	SD/MS_CLK_C	I/O
15	SD_CMD_C	I	16	MS_D3/XD_D0_C	I/O
17	GND	---	18	MS_CD#_C	I/O
19	GND	---	20	MS_D2/XD_D1_C	I/O
21	VCC_XD	---	22	MS_D0/XD_D2_C	I/O
23	MS_D3/XD_D0_C	I/O	24	MS_D1/XD_D7_C	I/O
25	SD/MS_CLK_C	I/O	26	MS_BS/XD_D3_C	I/O
27	GND	---	28	GND	---
29	MS_D2/XD_D1_C	I/O	30	SD_D0_C	I/O
31	MS_D0/XD_D2_C	I/O	32	SD_D1_C	I/O
33	MS_BS/XD_D3_C	I/O	34	XD_D4_C	I/O
35	XD_D5_C	I/O	36	XD_D6_C	I/O
37	MS_D1/XD_D7_C	I/O	38	VCC_XD	---
39	SD_CD#_C	I/O	40	GND	---
41	SM_WPI#/SD_WP_C	I	42	GND	---
43	GND	---			

CN34 SATA HDD Connector

CONN DIP HOUSING 22P 1R FR(P1.27,H6.7)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O

1	GND	---	2	SATA_TXP0	I
3	SATA_TXN0	I	4	GND	---
5	SATA_RXN0_C	O	6	SATA_RXP0_C	O
7	GND	---	8	+3.3VSATA1	---
9	+3.3VSATA1	---	10	+3.3VSATA1	---
11	GND	---	12	GND	---
13	GND	---	14	+5V	---
15	+5V	---	16	+5V	---
17	GND	---	18	NC	---
19	GND	---	20	NC	---
21	NC	---	22	NC	---

CN36 USB Connector

CONN DIP USB HOUSING 4P 1R FR(H7.6)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	USBPWR0	---	2	BUSBP0-	I/O
3	BUSBP0+	I/O	4	GND	---

CN37 RTC Connector

CONN SMD HEADER 2P MR(P1.25)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	VCCRTC	---	2	GND	---

CN38 1394 Port

CONN DIP 1394 4P FR(P0.8,H7.2)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	L1394_TPB0-	I/O	2	L1394_TPB0+	I/O
3	L1394_TPA0-	I/O	4	L1394_TPA0+	I/O

CN39 INT MIC Connector

CONN SMD HEADER 2P 1R MR(P1.25,H1.9)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	ADOGND	---	2	INT_MIC_R	---

CN40 Headphone Jack

CONN DIP PHONE JACK 8P 1R FR(H6.6)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	ADOGND	---	2	HPR_SYS	O
3	HPL_SYS	O	4	ADOGND	---
5	HP_JD	I	6	GND	---
7	+3V_SPD	---	8	SPDIF_OUT	O
9	GND	---	10	GND	---

CN41 SYSTEM MIC Jack

CONN DIP PHONE JACK 6P 1R FR(H6.6)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	ADOGND	---	2	MIC1_L	I
3	MIC1_R	I	4	Port_B#	I
5	ADOGND	---	6	NC	---

CN42 FM Connector

CONN SMD HOUSING 8P 1R FR(P0.5,H1.5)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	+3V	---	2	FM_CLOCK	O
3	FM_DATA	O	4	GND	---
5	FM_LEFT	O	6	FM_RIGHT	O
7	FM_DET	I	8	FM_INTX	I

CN43 MDC Connector

CONN SMD HEADER 12P 2R MR(P0.8,H5.35)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	NC	---	2	NC	---
3	NC	---	4	NC	---
5	NC	---	6	NC	---
7	DIB_P	I/O	8	NC	---
9	DIB_N	I/O	10	NC	---
11	NC	---	12	NC	---

Appendix D Display Codes

D.1 Display Codes

Table D-1 Scan codes (set 1 and set 2) (1/4)

Cap No.	Keytop	Code set 1		Code set 2			Note
		Make	Break	Make	Break		
01	‘ ~	29	A9	0E	F0	0E	
02	1 !	02	82	16	F0	16	
03	2 @	03	83	1E	F0	1E	
04	3 #	04	84	26	F0	26	
05	4 $	05	85	25	F0	25	
06	5 %	06	86	2E	F0	2E	
07	6 ^	07	87	36	F0	36	
08	7 &	08	88	3D	F0	3D	*2
09	8 *	09	89	3E	F0	3E	*2
10	9 (	0A	8A	46	F0	46	*2
11	0)	0B	8B	45	F0	45	
12	- _	0C	8C	4E	F0	4E	
13	= +	0D	8D	55	F0	55	
15	BkSp	0E	8E	66	F0	66	
16	Tab	0F	8F	0D	F0	0D	
17	Q	10	90	15	F0	15	
18	W	11	91	1D	F0	1D	
19	E	12	92	24	F0	24	
20	R	13	93	2D	F0	2D	
21	T	14	94	2C	F0	2C	
22	Y	15	95	35	F0	35	
23	U	16	96	3C	F0	3C	*2
24	I	17	97	43	F0	43	*2
25	O	13	98	44	F0	44	*2
26	P	19	99	4D	F0	4D	*2
27	[{	1A	9A	54	F0	54	
28	] }	1B	9B	5B	F0	5B	

Table D-1 Scan codes (set 1 and set 2) (2/4)

Cap No.	Keytop	Code set 1		Code set 2			Note
		Make	Break	Make	Break		
29	\ |	2B	AB	5D	F0	5D	*5
30	Caps Lock	3A	BA	58	F0	58	
31	A	1E	9E	1C	F0	1C	
32	S	1F	9F	1B	F0	1B	
33	D	20	A0	23	F0	23	
34	F	21	A1	2B	F0	2B	
35	G	22	A2	34	F0	34	
36	H	23	A3	33	F0	33	
37	J	24	A4	3B	F0	3B	*2
38	K	25	A5	42	F0	42	*2
39	L	26	A6	4B	F0	4B	*2
40	; :	27	A7	4C	F0	4C	*2
41	‘ “	28	A8	52	F0	52	
43	Enter	1C	9C	5A	F0	5A	*3
44	Shift (L)	2A	AA	12	F0	12	
45	No.102 key	56	D6	61	F0	61	
46	Z	2C	AC	1A	F0	1A	
47	X	2D	AD	22	F0	22	
48	C	2E	AE	21	F0	21	
49	V	2F	AF	2A	F0	2A	
50	B	30	B0	32	F0	32	
51	N	31	B1	31	F0	31	
52	M	32	B2	3A	F0	3A	*2
53	, <	33	B3	41	F0	41	*2
54	. >	34	B4	49	F0	49	*2
55	/ ?	35	B5	4A	F0	4A	*2
57	Shift (R)	36	B6	59	F0	59	

Table D-1 Scan codes (set 1 and set 2) (3/4)

Cap No.	Keytop	Code set 1		Code set 2		Note
		Make	Break	Make	Break	
58	Ctrl	1D	9D	14	F0 14	*3
60	Alt (L)	38	B8	11	F0 11	*3
61	Space	39	B9	29	F0 29	
62	ALT (R)	E0 38	E0 B8	E0 11	E0 F0 11	
75	Ins	E0 52	E0 D2	E0 70	E0 F0 70	*1
76	Del	E0 53	E0 D3	E0 71	E0 F0 71	*1
79	←	E0 4B	E0 CB	E0 6B	E0 F0 6B	*1
80	Home	E0 47	E0 C7	E0 6C	E0 F0 6C	*1
81	End	E0 4F	E0 CF	E0 69	E0 F0 69	*1
83	↑	E0 48	E0 C8	E0 75	E0 F0 75	*1
84	↓	E0 50	E0 D0	E0 72	E0 F0 72	*1
85	PgUp	E0 49	E0 C9	E0 7D	E0 F0 7D	*1
86	PgDn	E0 51	E0 D1	E0 7A	E0 F0 7A	*1
89	→	E0 4D	E0 CD	E0 74	E0 F0 74	*1
110	Esc	01	81	76	F0 76	
112	F1	3B	BB	05	F0 05	
113	F2	3C	BC	06	F0 06	
114	F3	3D	BD	04	F0 04	
115	F4	3E	BE	0C	F0 0C	
116	F5	3F	BF	03	F0 03	
117	F6	40	C0	0B	F0 0B	
118	F7	41	C1	83	F0 83	
119	F8	42	C2	0A	F0 0A	
120	F9	43	C3	01	F0 01	
121	F10	44	C4	09	F0 09	*3

Table D-1 Scan codes (set 1 and set 2) (4/4)

Cap No.	Keytop	Code set 1		Code set 2		Note
		Make	Break	Make	Break	
122	F11	57	D7	78	F0 78	*3
123	F12	58	D8	07	F0 07	*3
124	PrintSc	*6	*6	*6	*6	*6
126	Pause	*7	*7	*7	*7	*7
202	Fn	—	—	—	—	*4
203	Win	E0 5B	E0 DB	E0 1F	E0 F0 1F	
204	App	E0 5D	E0 DD	E0 2F	E0 F0 2F	

Notes:

1. * Scan codes differ by mode.
2. * Scan codes differ by overlay function.
3. * Combined with the **Fn** key makes different codes.
4. * **Fn** key does not generate a code by itself.
5. * This key corresponds to key No. 42 in a 102-key model.
6. * Refer to Table D-6, No. 124 key scan code.
7. * Refer to Table D-7, No. 126 key scan code.

Table D-2 Scan codes with left Shift key

Cap No.	Key top	Code set 1		Code set 2	
		Make	Break	Make	Break
55	/	E0 AA E0 35	E0 B5 E0 2A	E0 F0 12 E0 4A	E0 F0 4A E0 12
75	INS	E0 AA E0 52	E0 D2 E0 2A	E0 F0 12 E0 70	E0 F0 70 E0 12
76	DEL	E0 AA E0 53	E0 D3 E0 2A	E0 F0 12 E0 71	E0 F0 71 E0 12
79	←	E0 AA E0 4B	E0 CB E0 2A	E0 F0 12 E0 6B	E0 F0 6B E0 12
80	Home	E0 AA E0 47	E0 C7 E0 2A	E0 F0 12 E0 6C	E0 F0 6C E0 12
81	End	E0 AA E0 4F	E0 CF E0 2A	E0 F0 12 E0 69	E0 F0 69 E0 12
83	↑	E0 AA E0 48	E0 C8 E0 2A	E0 F0 12 E0 75	E0 F0 75 E0 12
84	↓	E0 AA E0 50	E0 D0 E0 2A	E0 F0 12 E0 72	E0 F0 72 E0 12
85	PgUp	E0 AA E0 49	E0 C9 E0 2A	E0 F0 12 E0 7D	E0 F0 7D E0 12
86	PgDn	E0 AA E0 51	E0 D1 E0 2A	E0 F0 12 E0 7A	E0 F0 7A E0 12
89	→	E0 AA E0 4D	E0 CD E0 2A	E0 F0 12 E0 74	E0 F0 74 E0 12
203	Win	E0 AA E0 5B	E0 DB E0 2A	E0 F0 12 E0 1F	E0 F0 1F E0 12
204	App	E0 AA E0 5D	E0 DD E0 2A	E0 F0 12 E0 2F	E0 F0 2F E0 12

Note : The table above shows scan codes with the left **Shift** key. In combination with the right **Shift** key, scan codes are changed as listed below:

	With left **Shift**	With right **Shift**
Set 1	E0 AA ___________	E0 B6
	E0 2A ____________	E0 36
Set 2	E0 F0 12 _________	E0 F0 59
	E0 12 ____________	E0 59

Table D-3 Scan codes in Numlock mode

Cap No.	Key top	Code set 1								Code set 2									
		Make				Break				Make				Break					
75	INS	E0	2A	E0	52	E0	D2	E0	AA	E0	12	E0	70	E0	F0	70	E0	F0	12
76	DEL	E0	2A	E0	53	E0	D3	E0	AA	E0	12	E0	71	E0	F0	71	E0	F0	12
79	←	E0	2A	E0	4B	E0	CB	E0	AA	E0	12	E0	6B	E0	F0	6B	E0	F0	12
80	Home	E0	2A	E0	47	E0	C7	E0	AA	E0	12	E0	6C	E0	F0	6C	E0	F0	12
81	End	E0	2A	E0	4F	E0	CF	E0	AA	E0	12	E0	69	E0	F0	69	E0	F0	12
83	↑	E0	2A	E0	48	E0	C8	E0	AA	E0	12	E0	75	E0	F0	75	E0	F0	12
84	↓	E0	2A	E0	50	E0	D0	E0	AA	E0	12	E0	72	E0	F0	72	E0	F0	12
85	PgUp	E0	2A	E0	49	E0	C9	E0	AA	E0	12	E0	7D	E0	F0	7D	E0	F0	12
86	PgDn	E0	2A	E0	51	E0	D1	E0	AA	E0	12	E0	7A	E0	F0	7A	E0	F0	12
89	→	E0	2A	E0	4D	E0	CD	E0	AA	E0	12	E0	74	E0	F0	74	E0	F0	12
203	Win	E0	2A	E0	5B	E0	DB	E0	AA	E0	12	E0	1F	E0	F0	1F	E0	F0	12
204	App	E0	2A	E0	5D	E0	DD	E0	AA	E0	12	E0	2F	E0	F0	2F	E0	F0	12

Table D-4 Scan codes with Fn key

Cap No.	Keytop	Code set 1				Code set 2				
		Make		Break		Make		Break		
43	ENT	E0	1C	E0	9C	E0	5A	E0	F0	5A
58	CTRL	E0	1D	E0	9D	E0	14	E0	F0	14
60	LALT	E0	38	E0	B8	E0	11	E0	F0	11
121	ARROW	45		C5		77		F0	77	
122	NUMERIC	45		C5		77		F0	77	
123	Scrl	46		C5		7E		F0	7E	

Table D-5 Scan codes in overlay mode

Cap No.	Keytop		Code set 1 Make	Code set 1 Break	Code set 2 Make	Code set 2 Break
09	8	(8)	48	C8	75	F0 75
10	9	(9)	49	C9	7D	F0 7D
11	0	(*)	37	B7	7C	F0 7C
23	U	(4)	4B	CB	6B	F0 6B
24	I	(5)	4C	CC	73	F0 73
25	O	(6)	4D	CD	74	F0 74
26	P	(–)	4A	CA	7B	F0 7B
37	J	(1)	4F	CF	69	F0 69
38	K	(2)	50	D0	72	F0 72
39	L	(3)	51	D1	7A	F0 7A
40	;	(+)	4E	CE	79	F0 79
52	M	(0)	52	D2	70	F0 70
54	.	(.)	53	D3	71	F0 71
55	/	(/)	E0 35	E0 B5	40 4A	E0 F0 4A

Table D-6 No.124 key scan code

Key top	Shift	Code set 1 Make	Code set 1 Break	Code set 2 Make	Code set 2 Break
Prt Sc	Common	E0 2A E0 37	E0 B7 E0 AA	E0 12 E0 7C	E0 F0 7C E0 F0 12
	Ctrl +	E0 37	E0 B7	E0 7C	E0 F0 7C
	Shift +	E0 37	E0 B7	E0 7C	E0 F0 7C
	Alt +	54	D4	84	F0 B4

Table D-7 No.126 key scan code

Key top	Shift	Code set 1	Code set 2
		Make	Make
Pause	Common*	E1 1D 45 E1 9D C5	E1 14 77 E1 F0 14 F0 77
	Ctrl*	E0 46 E0 C6	E0 7E E0 F0 7E

*: This key generates only make codes.

1. United Status (US) Keyboard

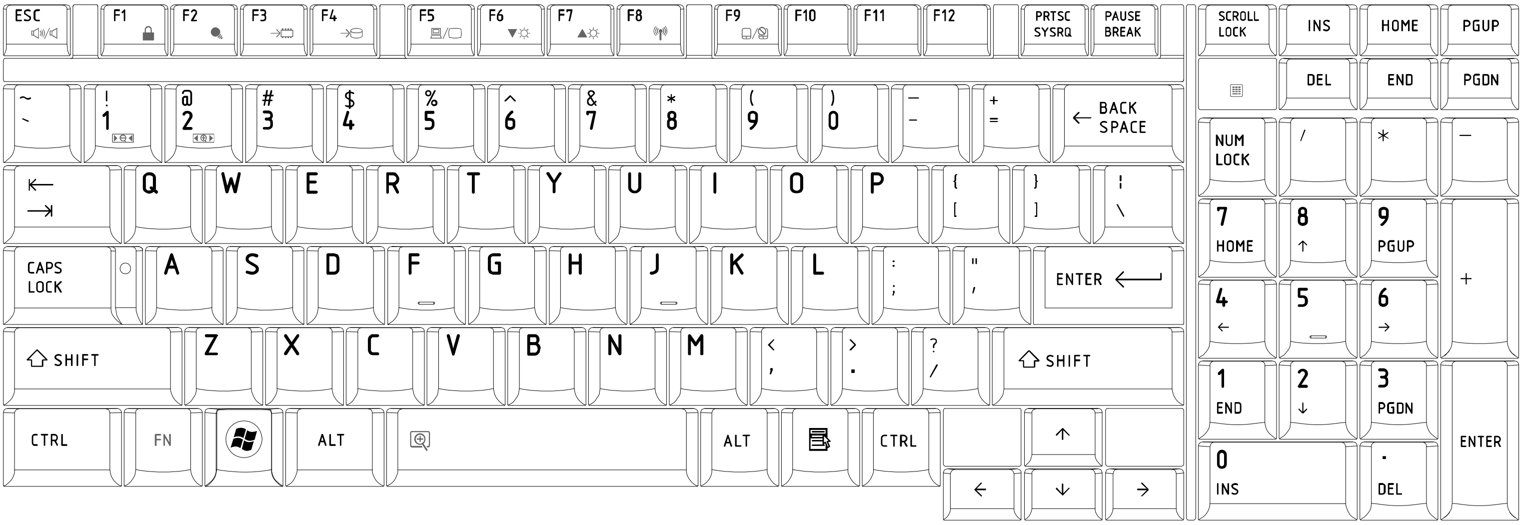


Figure1 US Keyboard layout

2. Traditional Chinese (CH) Keyboard

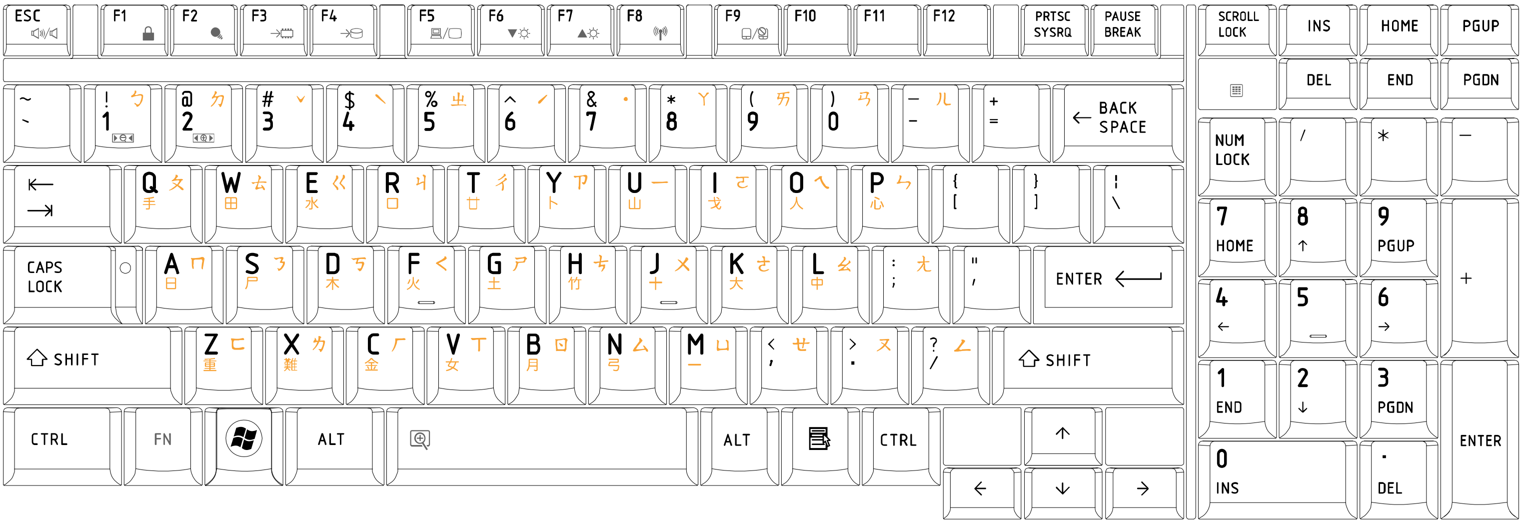


Figure 2 CH Keyboard layout

3. Thai (TI) Keyboard

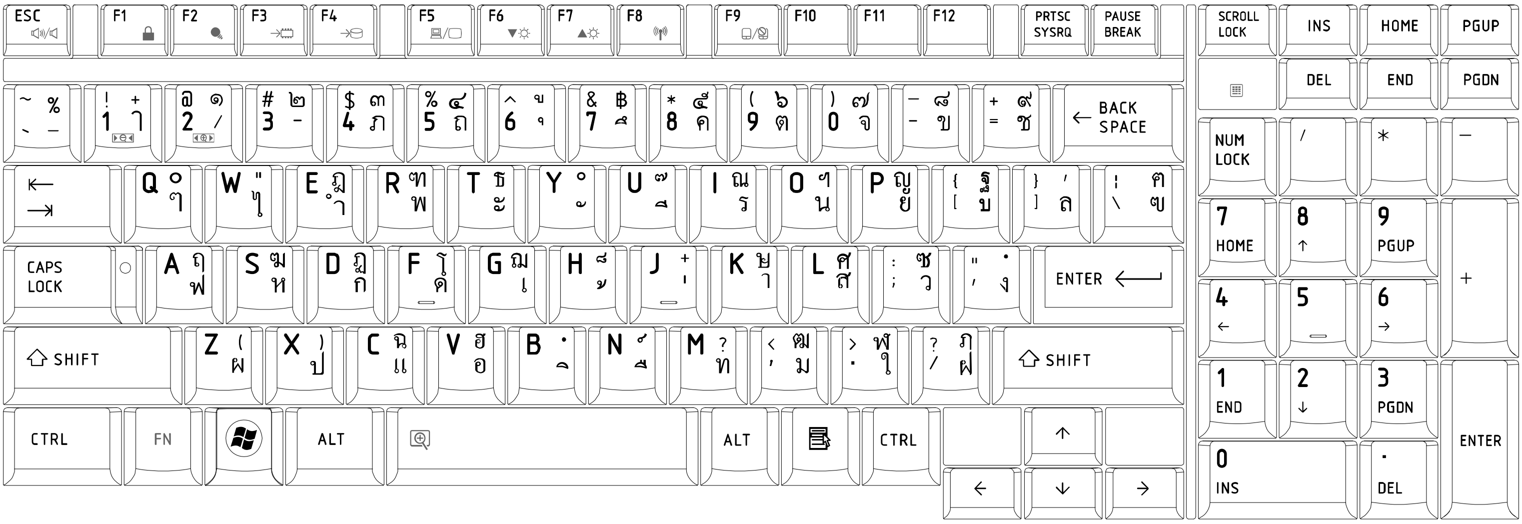


Figure 3 TI Keyboard layout

4. Korean (KO) Keyboard

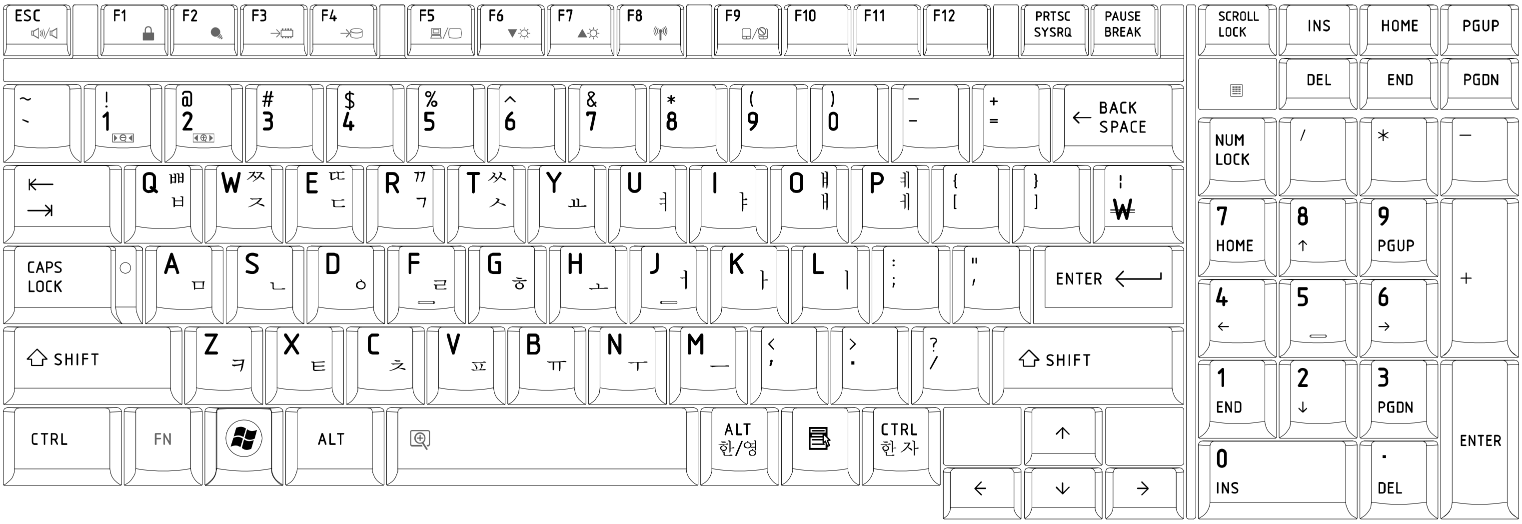


Figure **4 KO** Keyboard layout

5. United Kingdom (UK) Keyboard

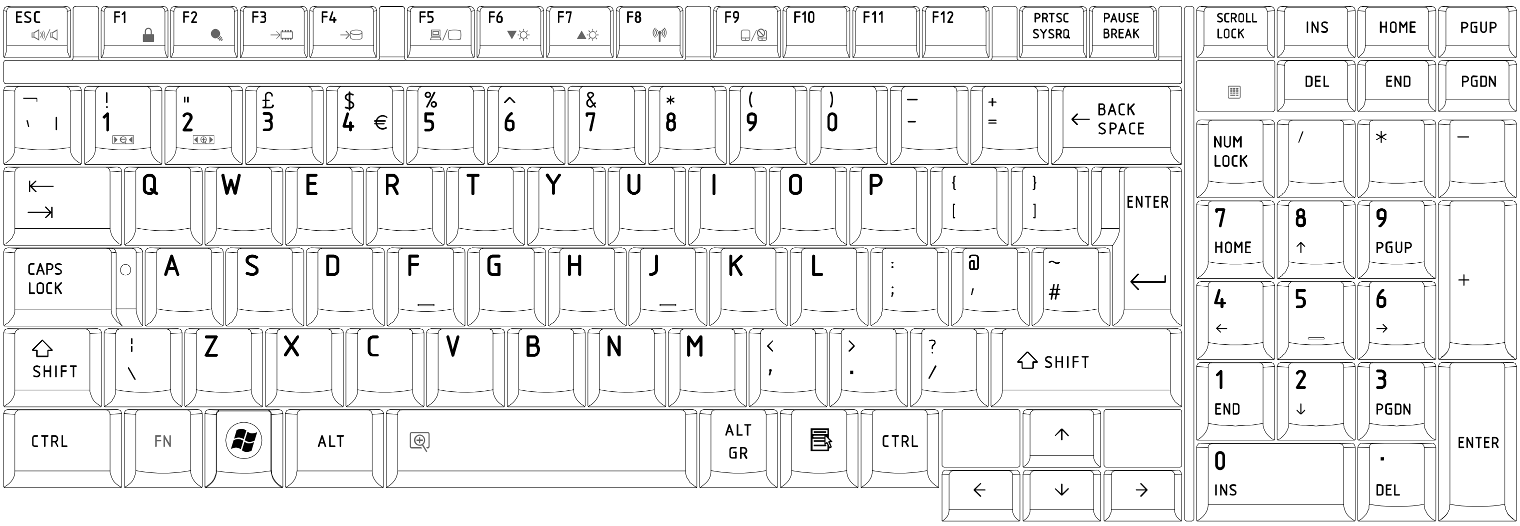


Figure**5 UK** Keyboard layout

6. US International (UI) Keyboard

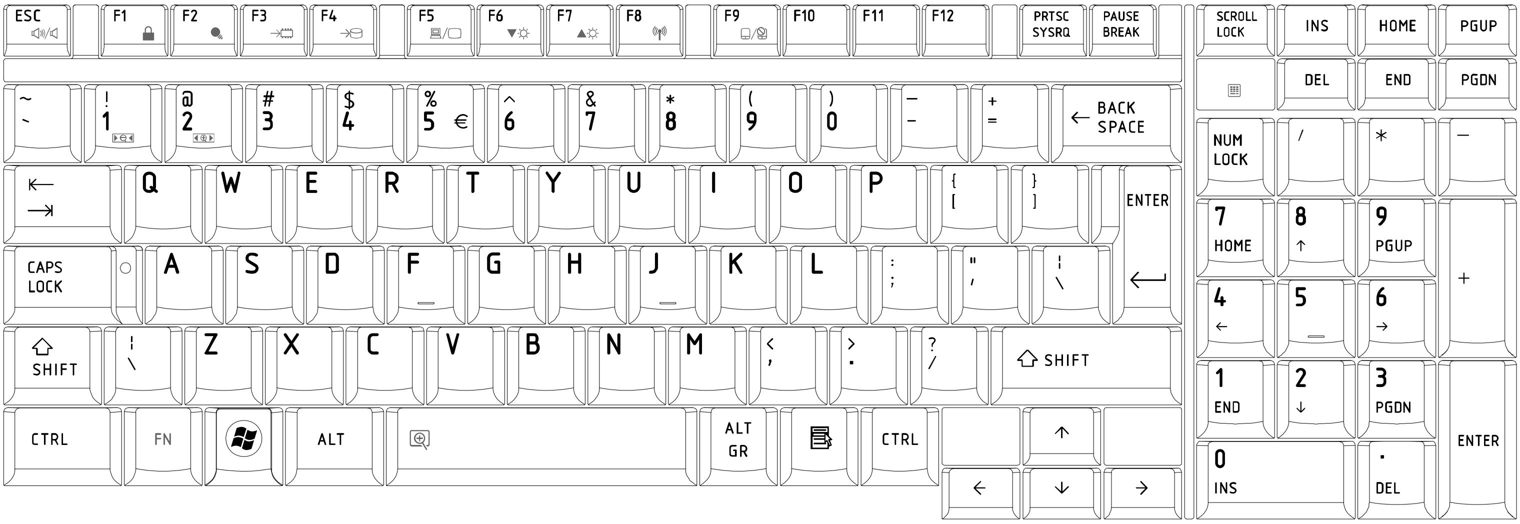


Figure **6 UI** Keyboard layout

7. Hebrew (HB) Keyboard



Figure**7 HB** Keyboard layout

8. Danish (DM) Keyboard

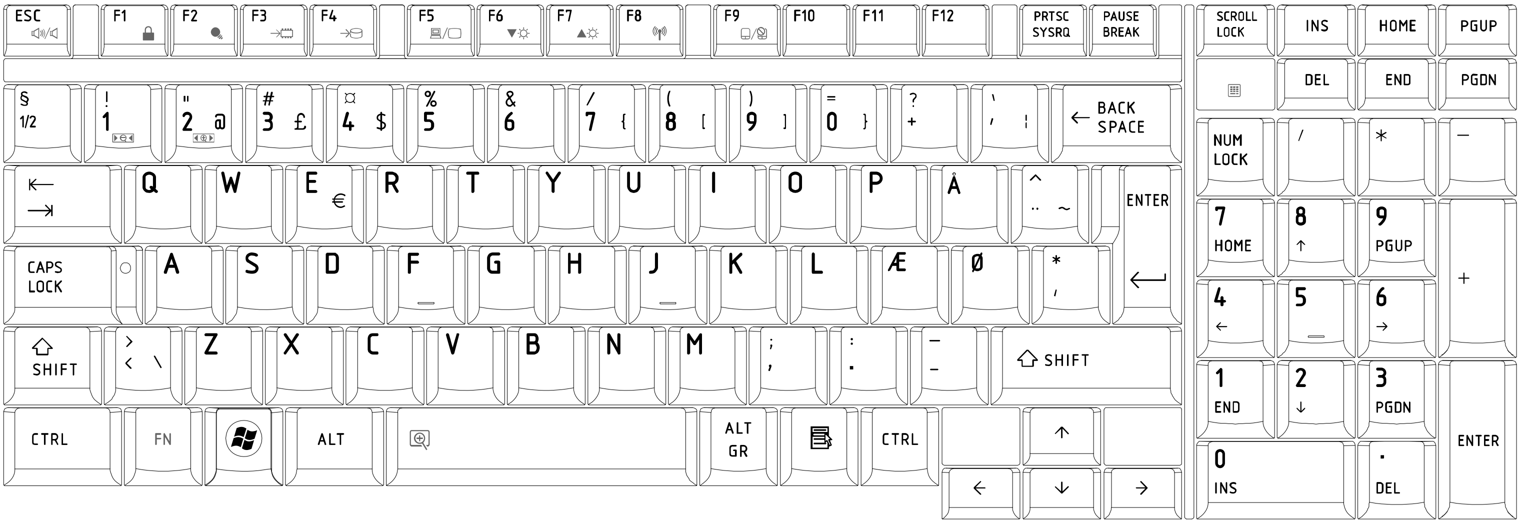


Figure8 DM Keyboard layout

9. Swiss (SW) Keyboard

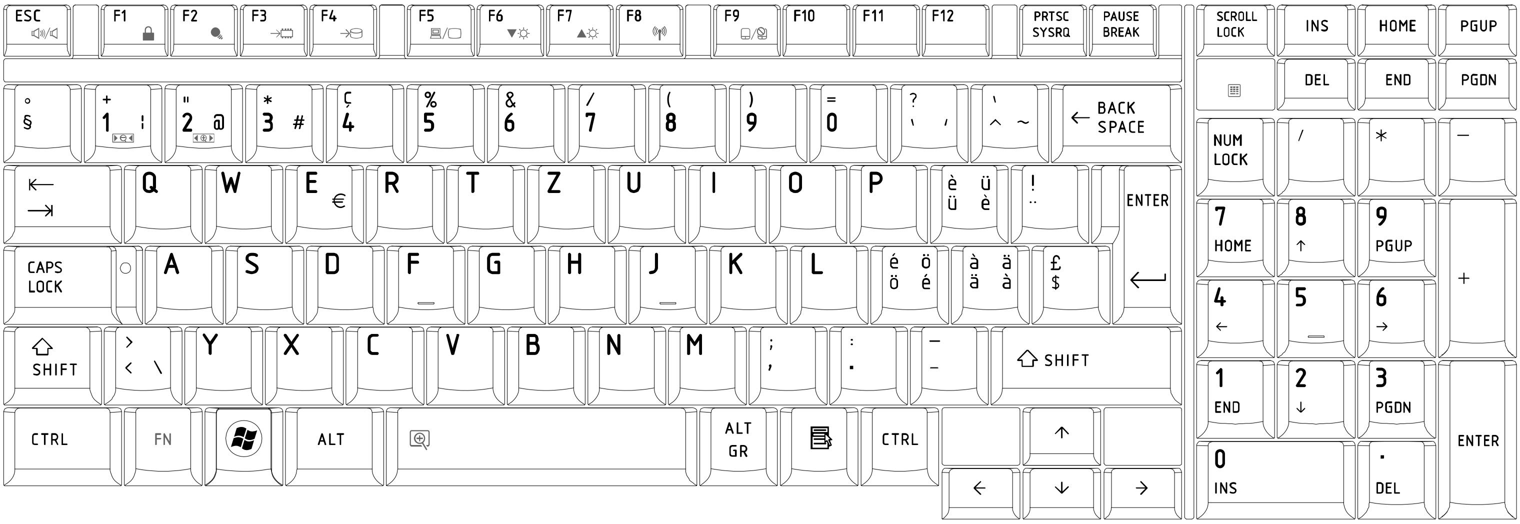


Figure**9 SW** Keyboard layout

10. Arabic (ARE) Keyboard

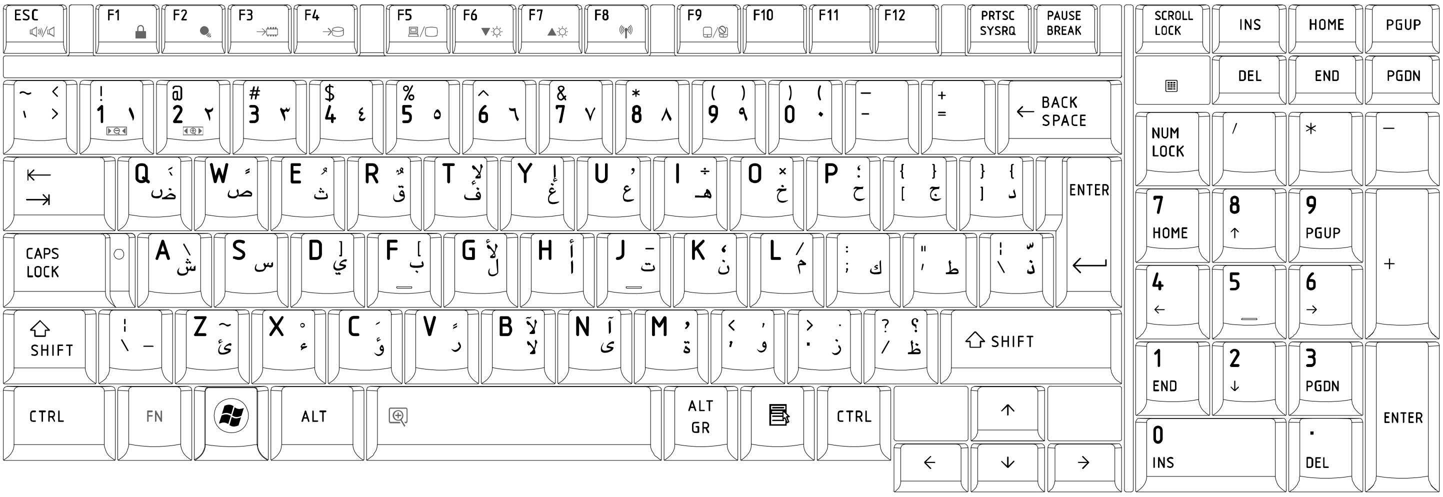


Figure**10 ARE** Keyboard layout

11. Czech (CZ) Keyboard

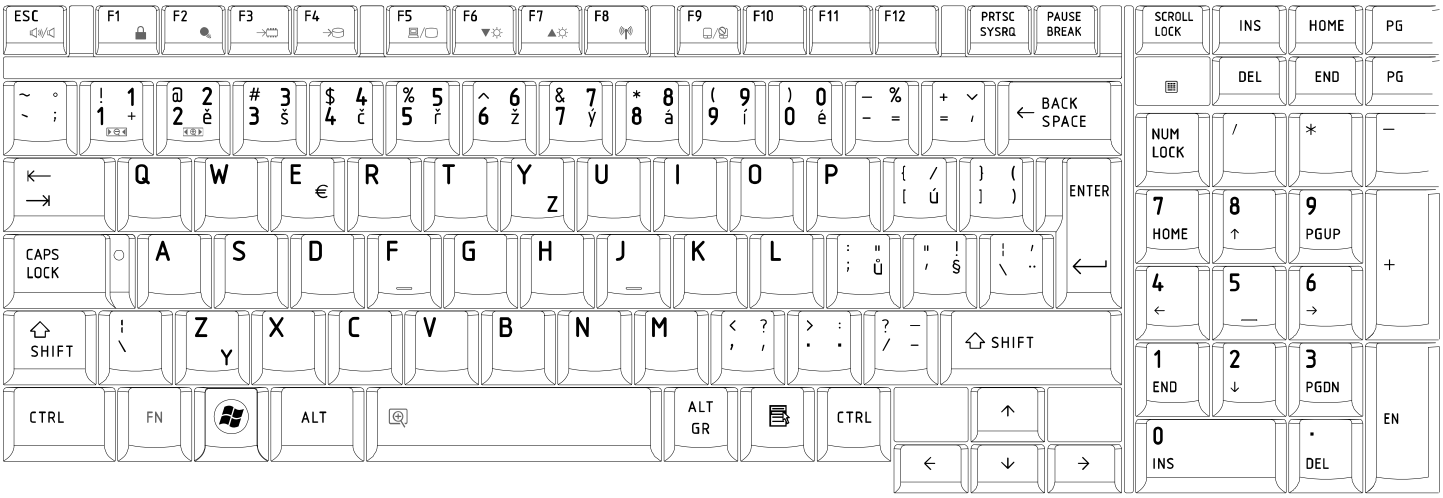


Figure11 **CZ** Keyboard layout

12. Russian (RU) Keyboard

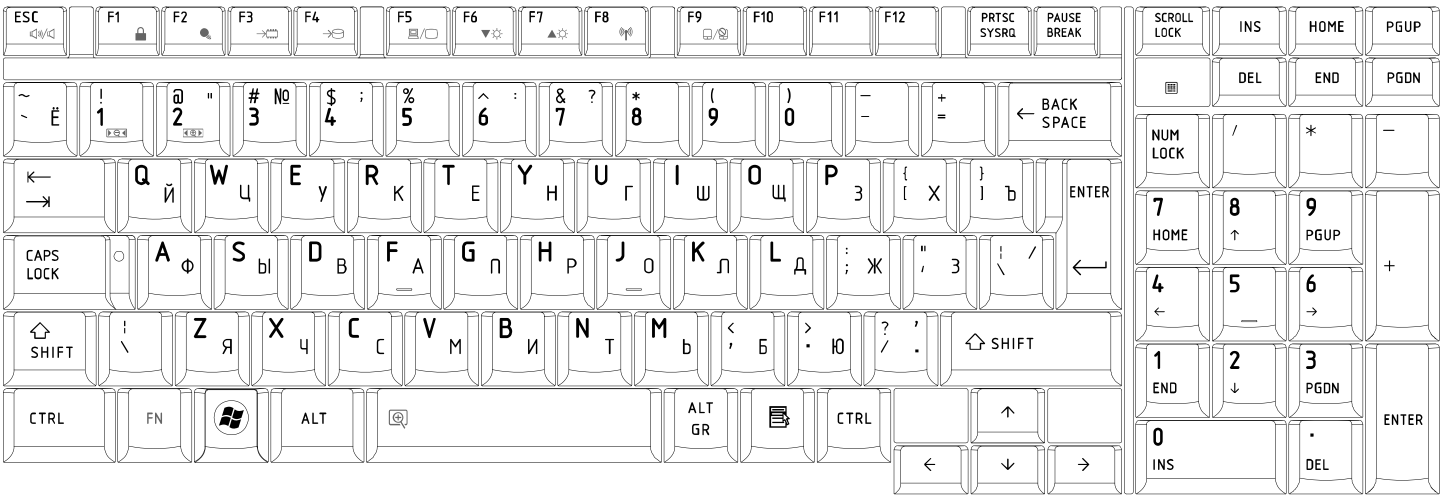


Figure1**2 RU** Keyboard layout

13. Portuguese (PO) Keyboard

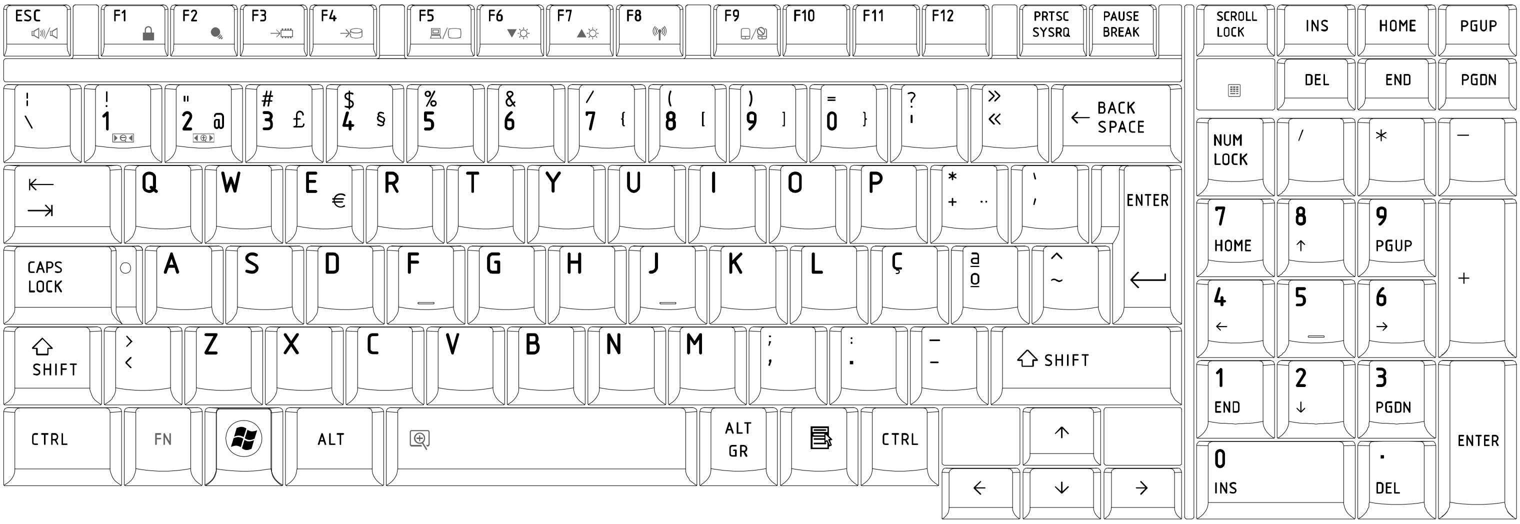


Figure13 PO Keyboard layout

14.Slovakian (SL) Keyboard

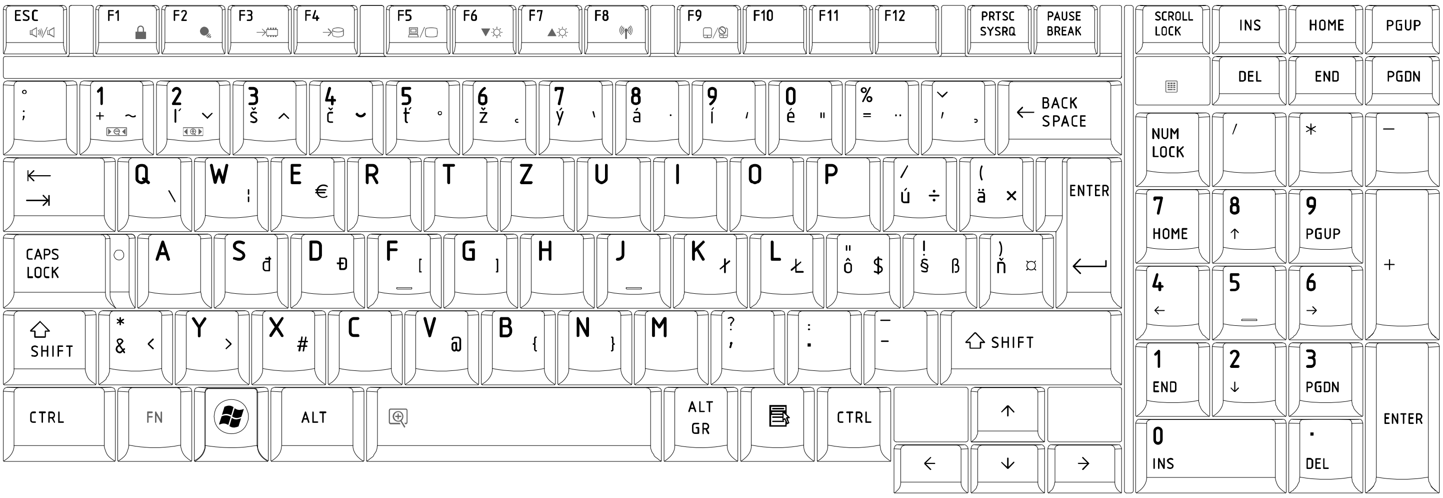


Figure14 SL Keyboard layout

15. Italian (IT) Keyboard

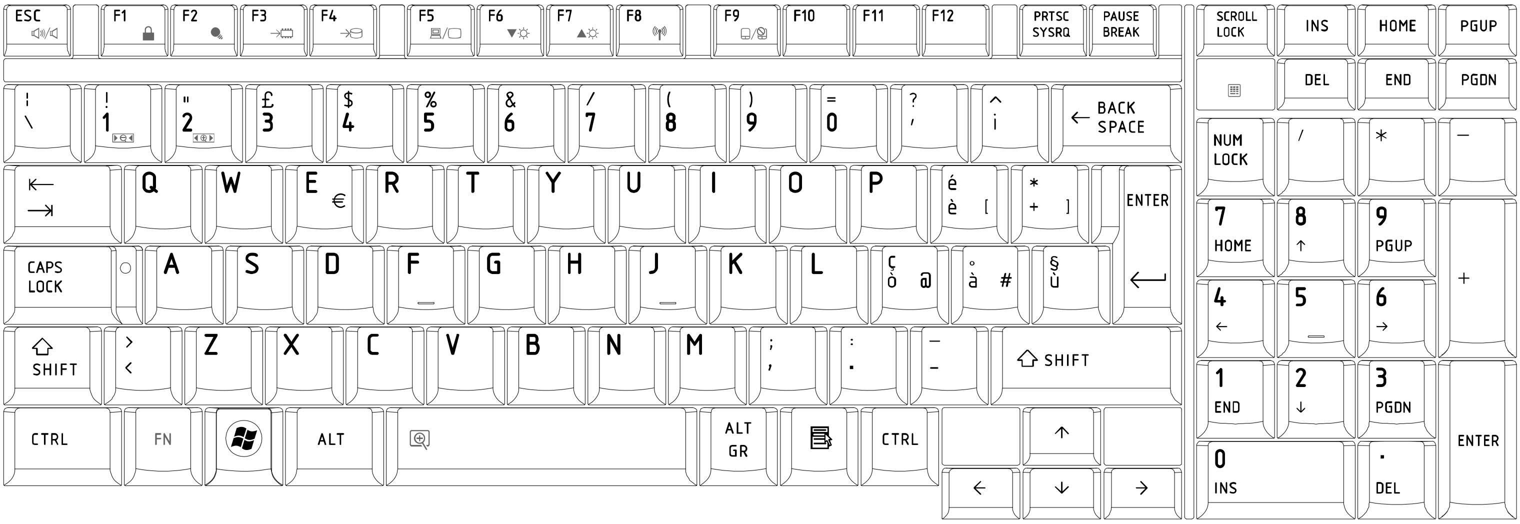


Figure15 **IT** Keyboard layout

16. French (FR) Keyboard

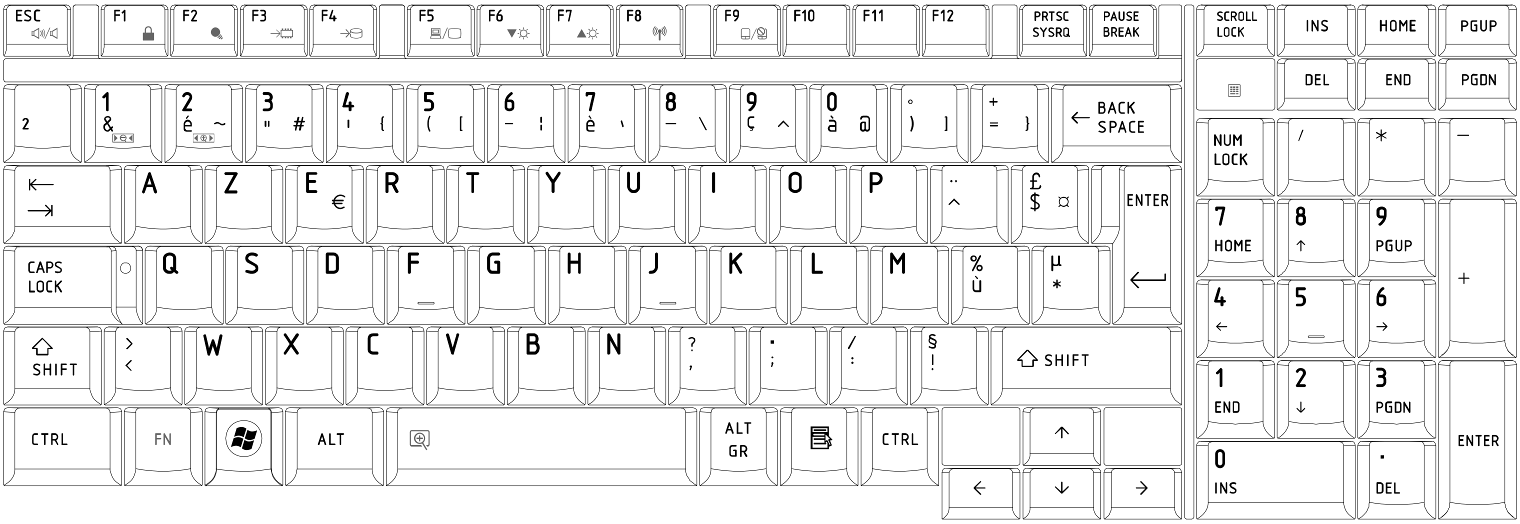


Figure16 **FR** Keyboard layout

17. German (GR) Keyboard

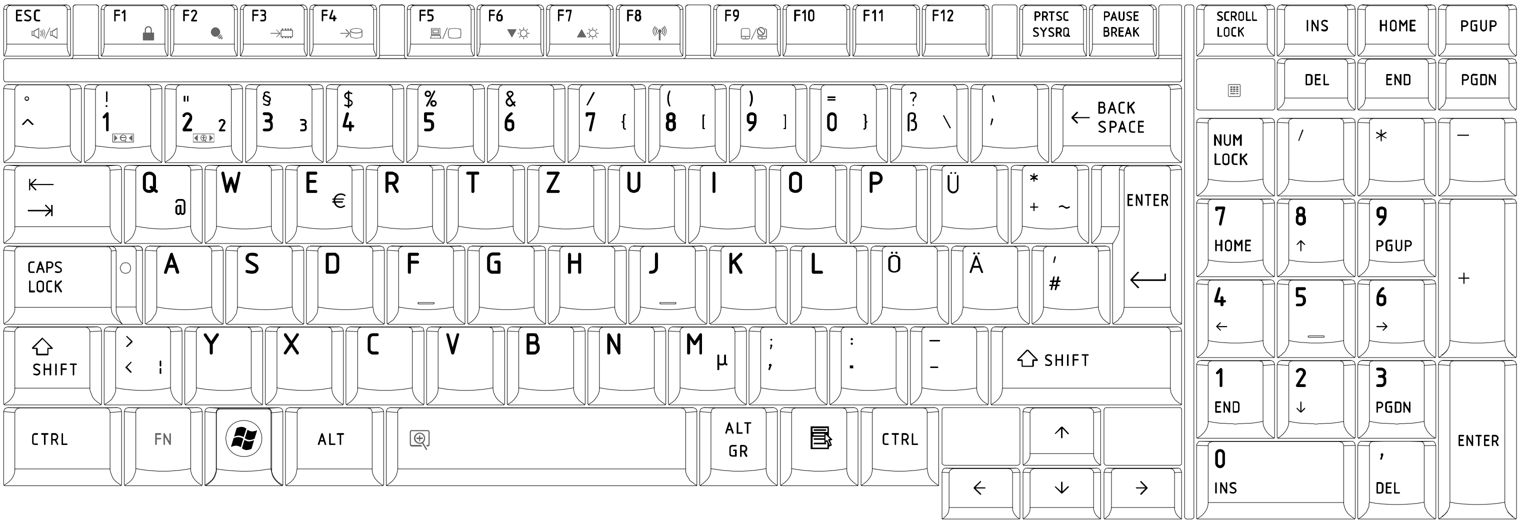


Figure17 **GR** Keyboard layout

18. Greek (GK) Keyboard

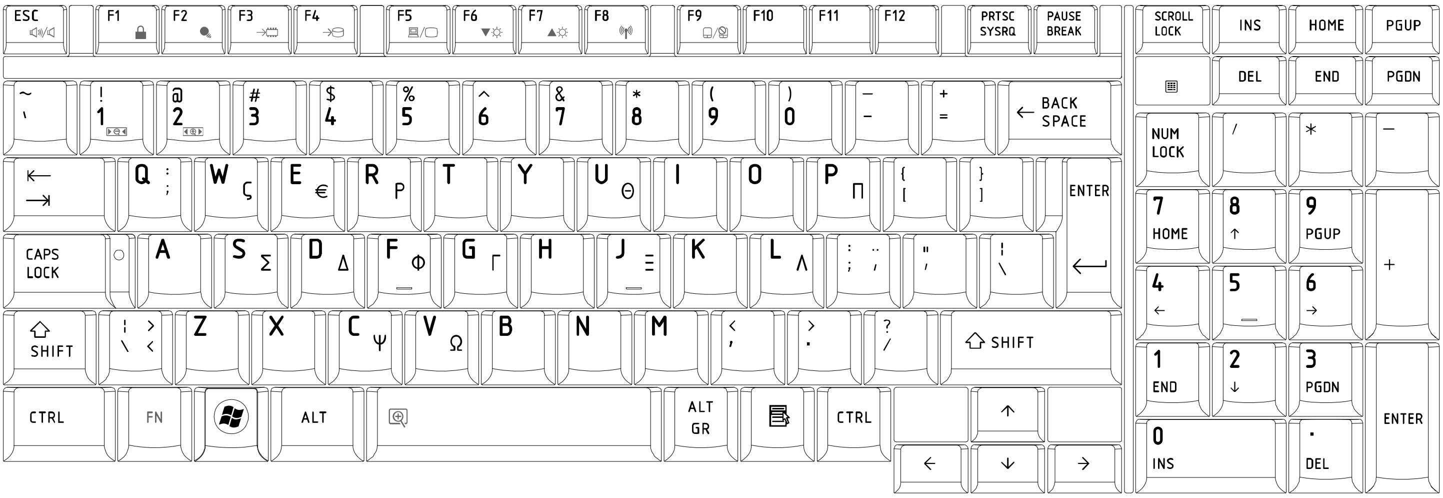


Figure18 **GK** Keyboard layout

19. Hungarian (HG) Keyboard



Figure19 **HG** Keyboard layout

20. Spanish (SP) Keyboard

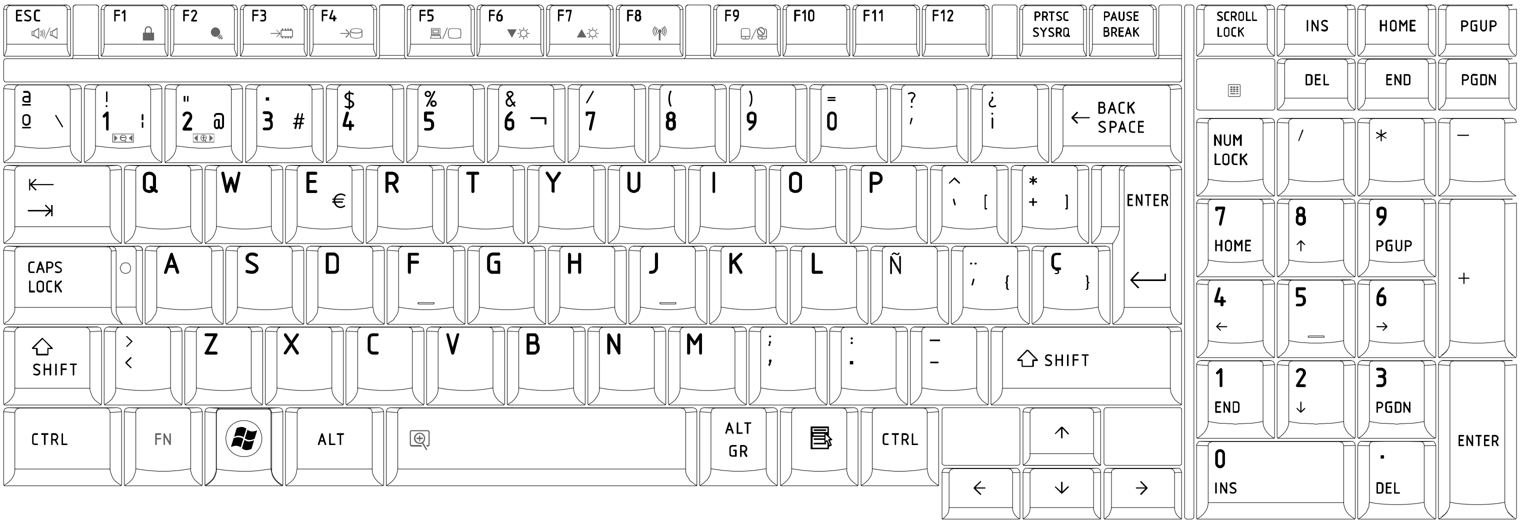


Figure20 SP Keyboard layout

21.Turkish (TR) Keyboard

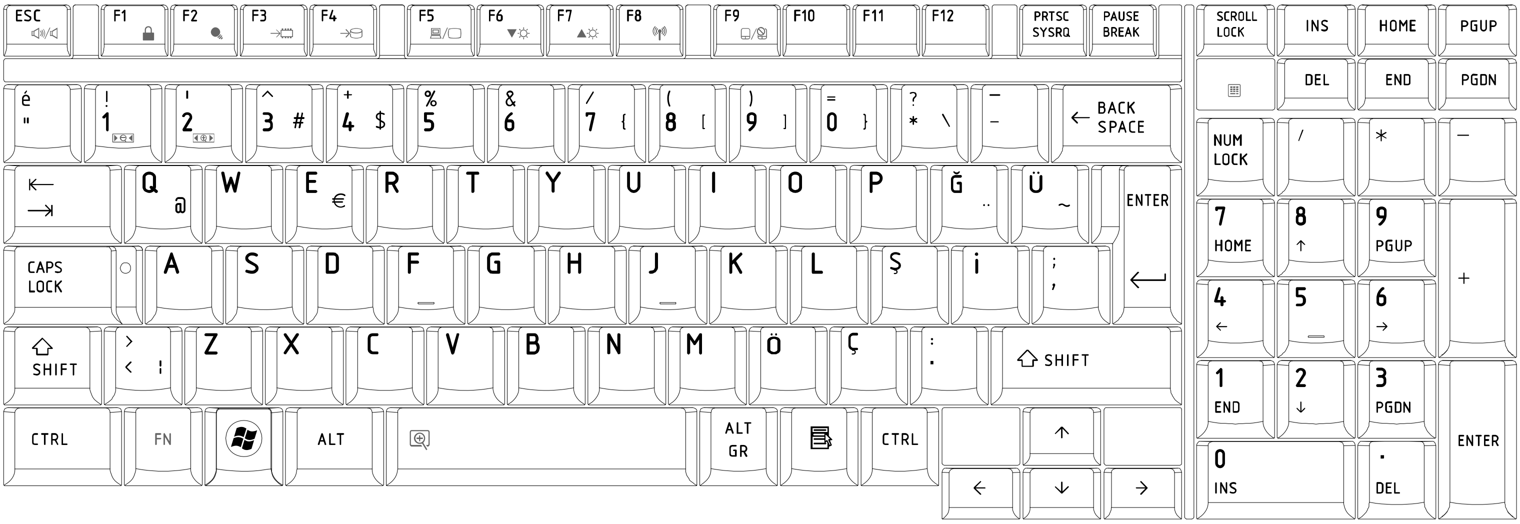


Figure 21 TR Keyboard layout

22.Turkish F (TR-F) Keyboard



Figure**22 TR-F** Keyboard layout

23.Swedish (SD) Keyboard

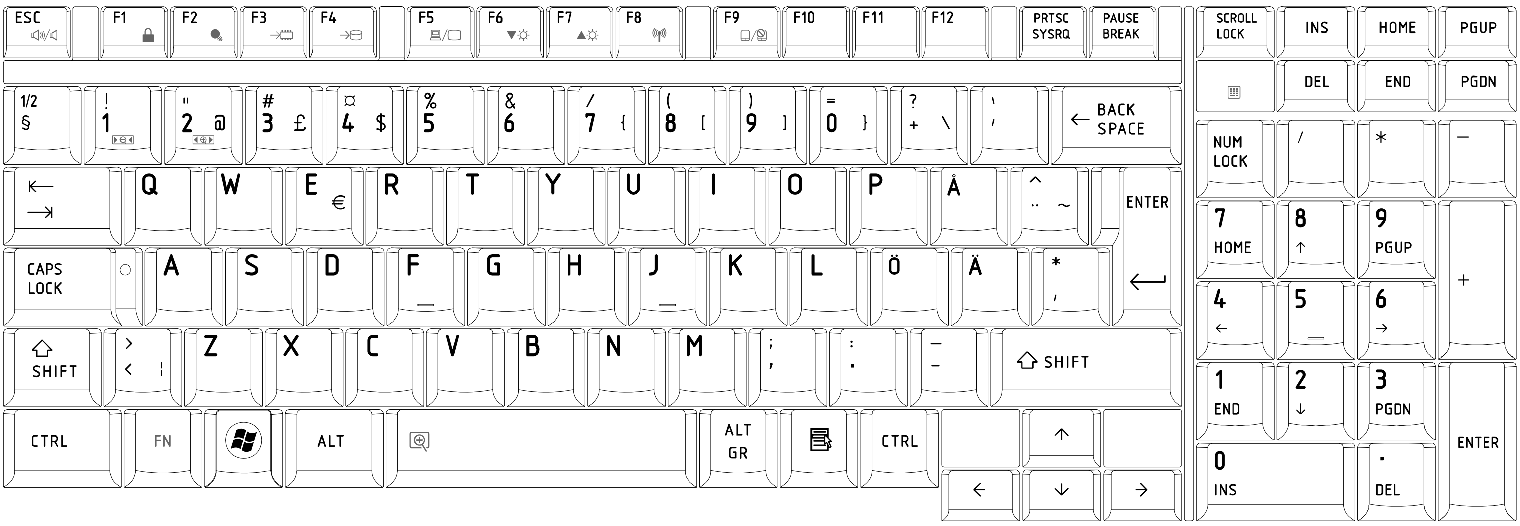


Figure **23 SD** Keyboard layout

24.Belgian (BE) Keyboard

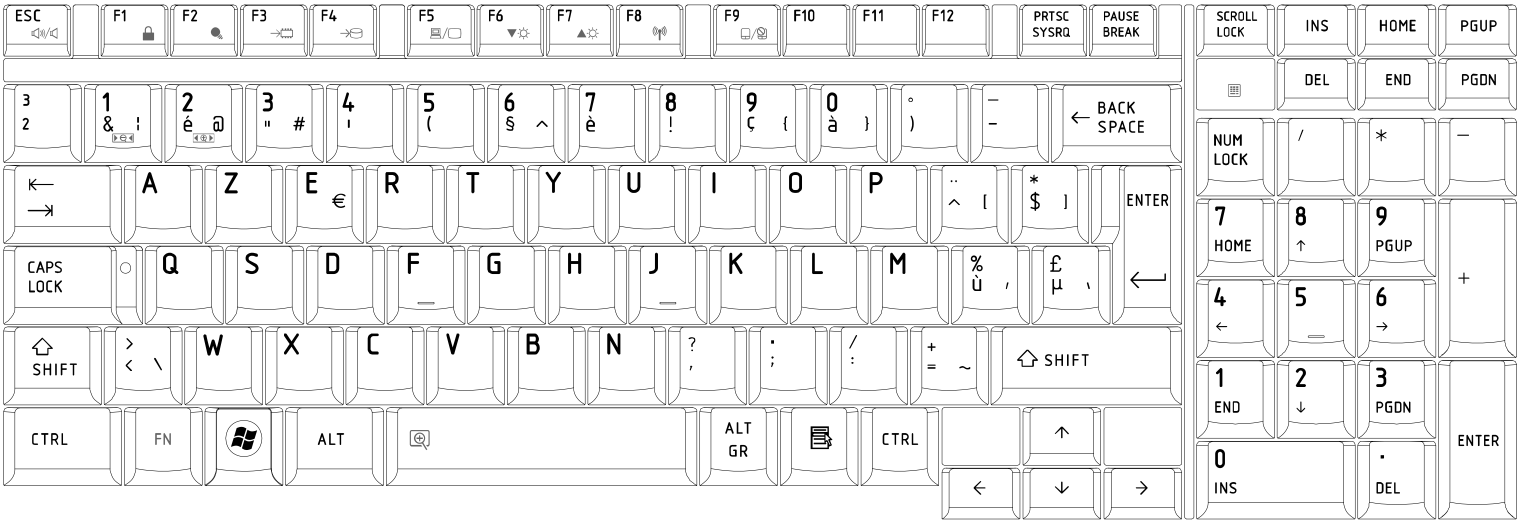


Figure**24 BE** Keyboard layout

25.Yugoslavian (YU) Keyboard

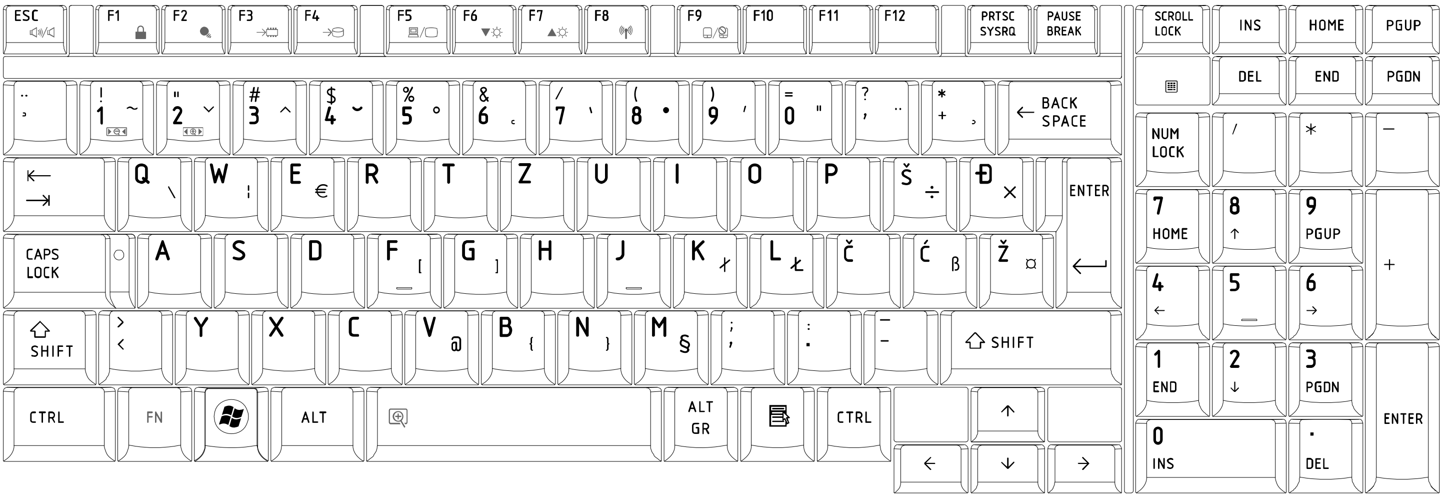


Figure**25 YU** Keyboard layout

26.Norwegian (NW) Keyboard

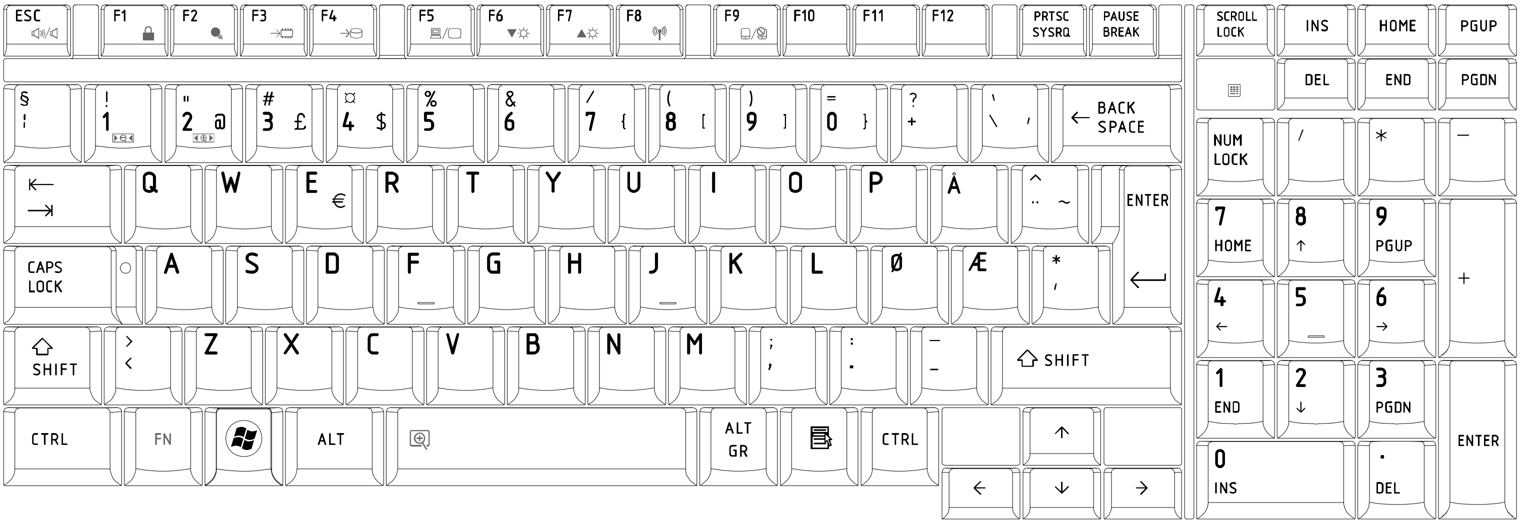


Figure**26 NW** Keyboard layout

27.Scandinavian (ND) Keyboard

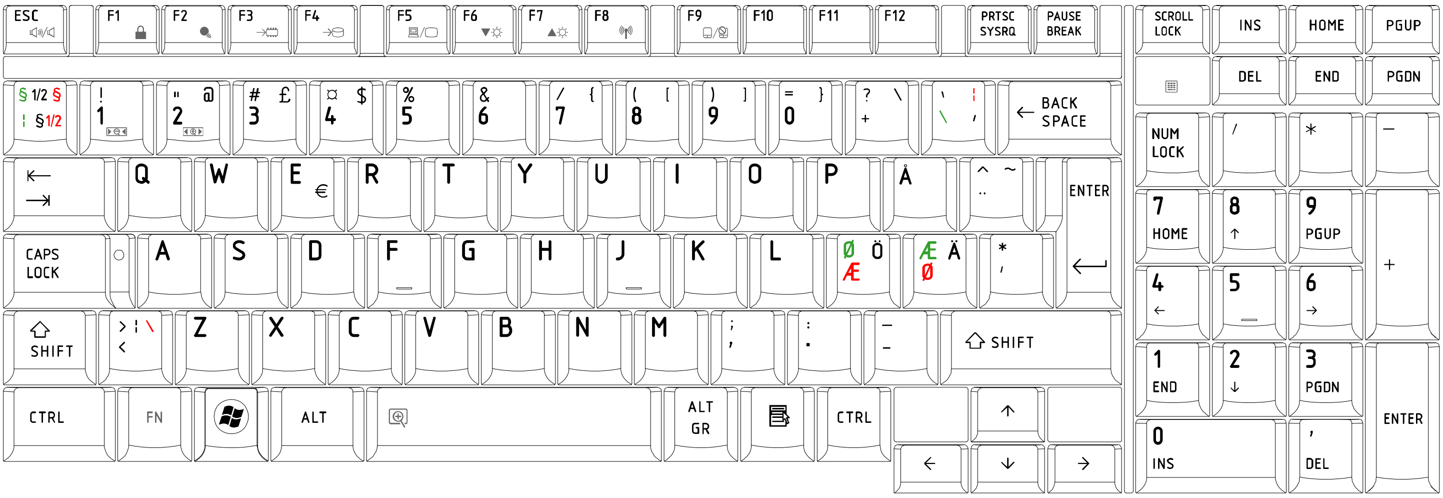


Figure**27 ND** Keyboard layout

28.Canadian Multinational(AC)Keyboard

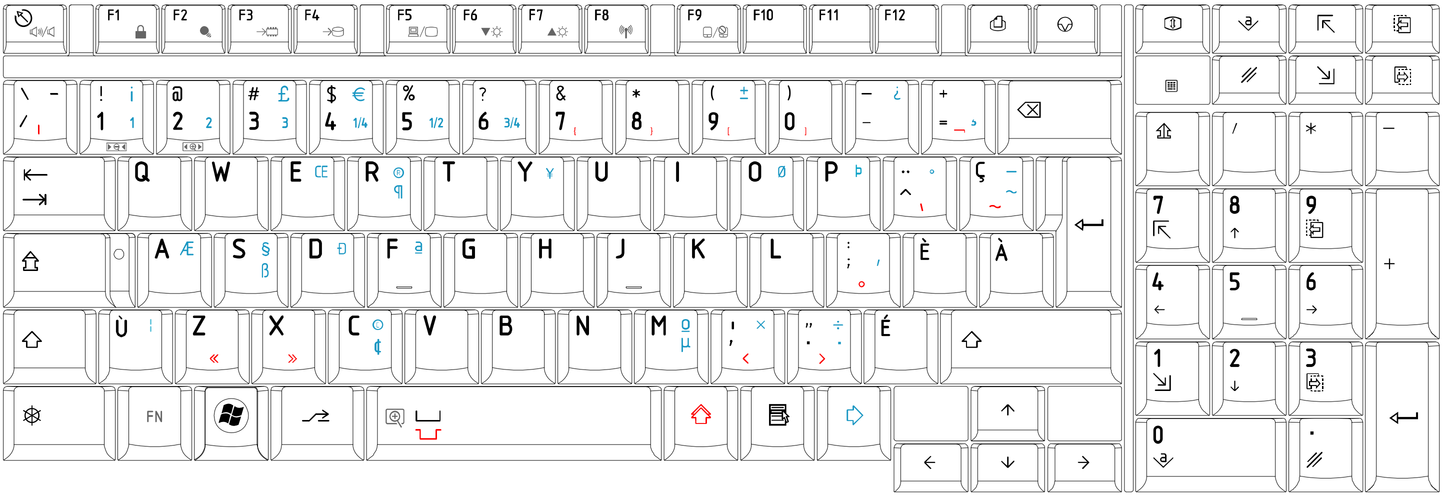


Figure28 AC Keyboard layout

29.Canadian Bilingual (CB) Keyboard

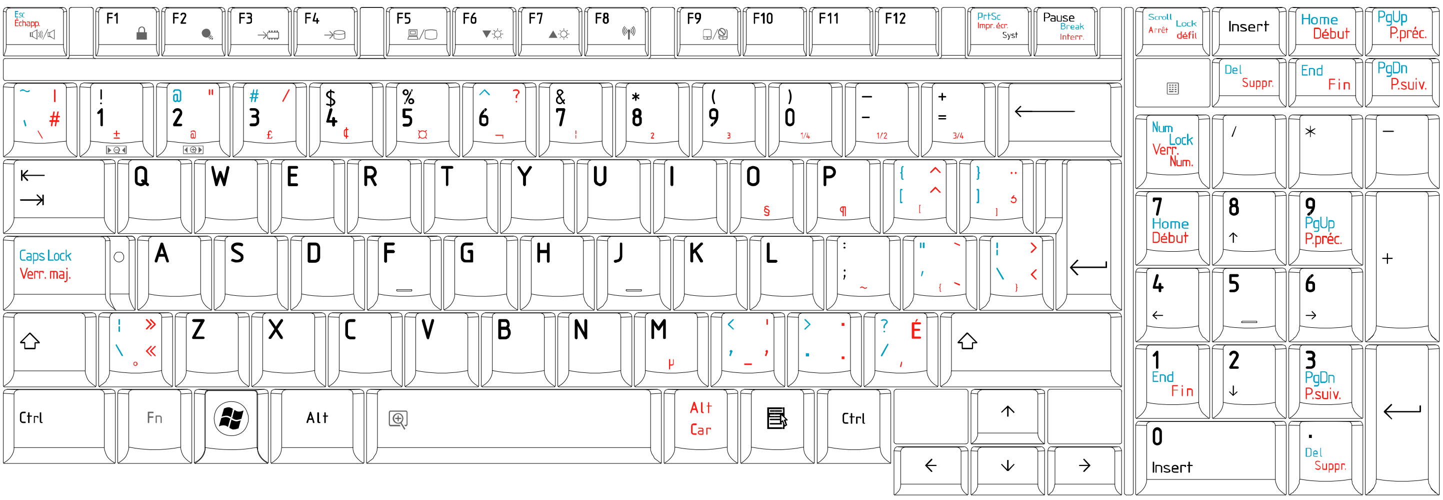


Figure29 CB Keyboard layout

30. Japanese (JP) Keyboard



Figure30 JP Keyboard layout

Appendix E Key Layout

1. United Status (US) Keyboard

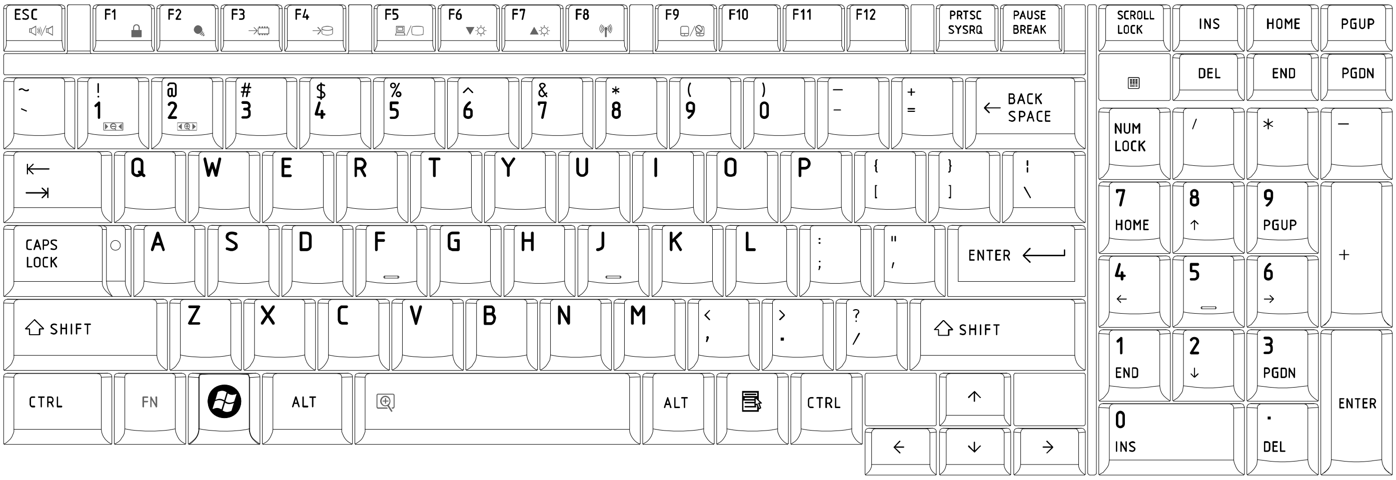


Figure US keyboard

2. Traditional Chinese (CH) Keyboard

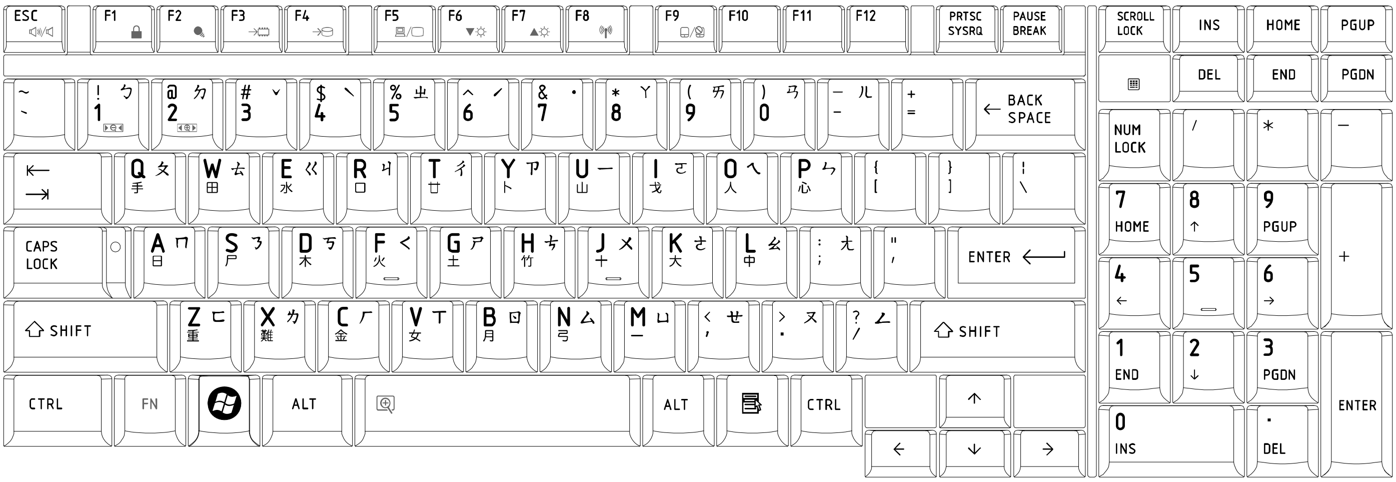


Figure CH keyboard

3. Thai (TI) Keyboard

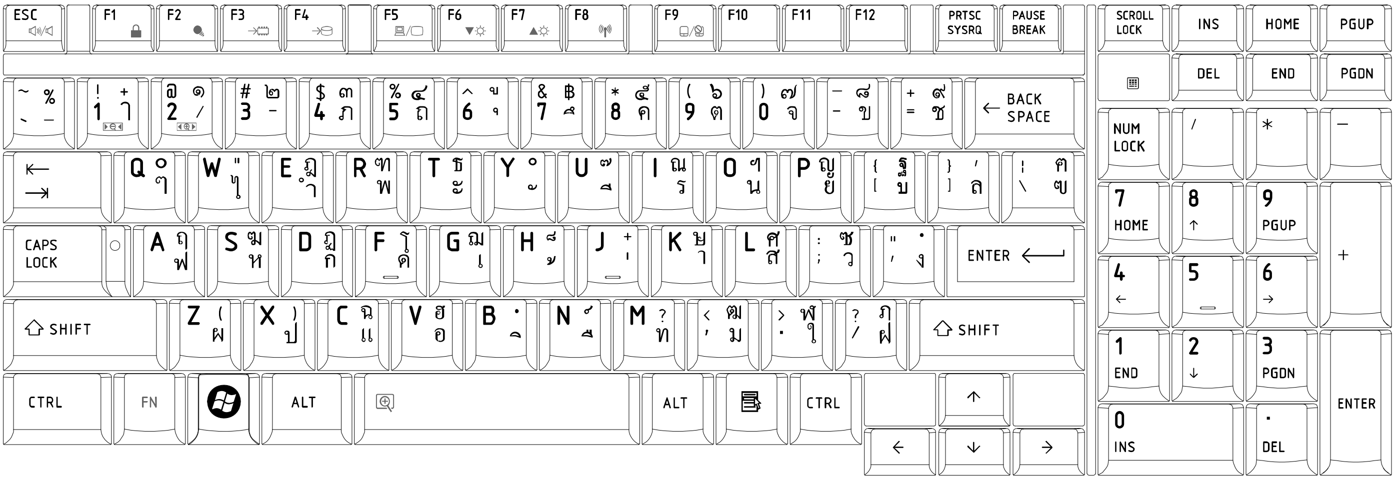


Figure TI keyboard

4. Korean (KO) Keyboard

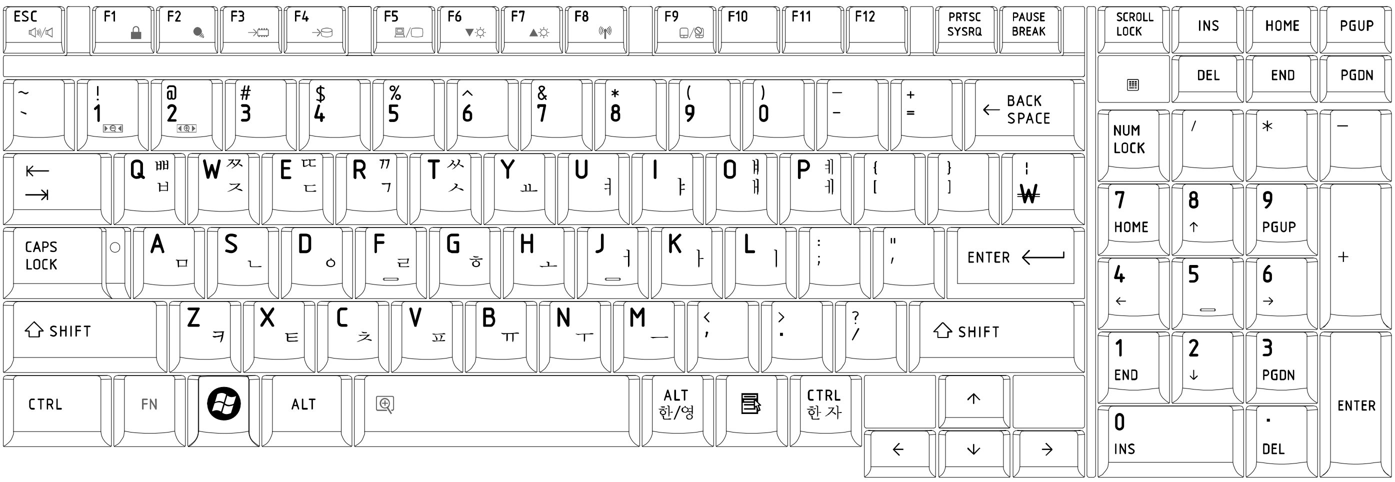


Figure KO keyboard

5. United Kingdom (UK) Keyboard

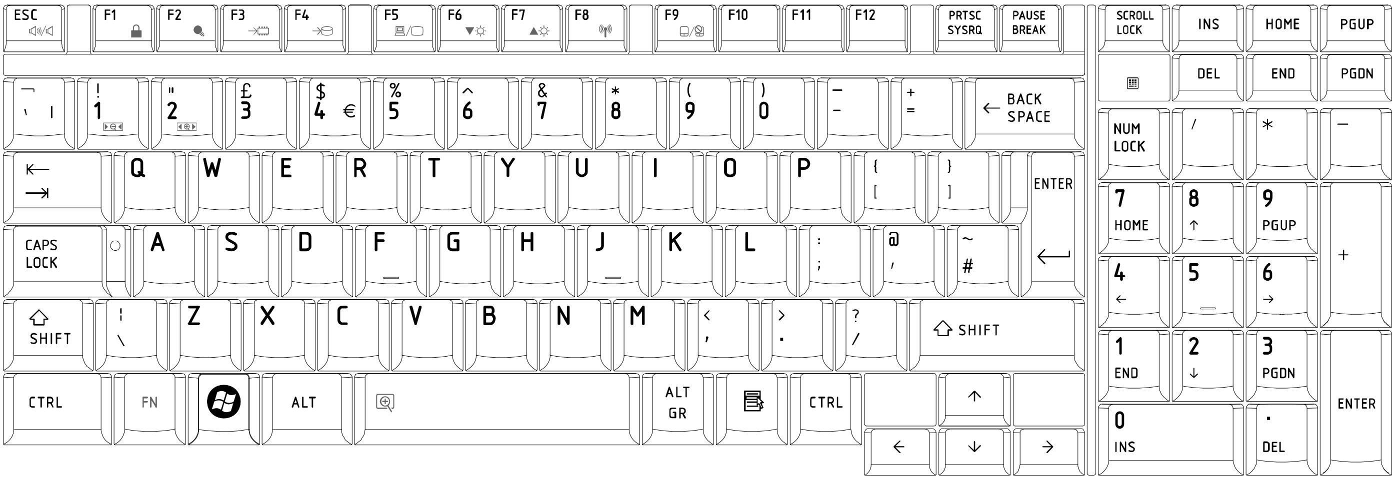


Figure UK keyboard

6. US International (UI) Keyboard

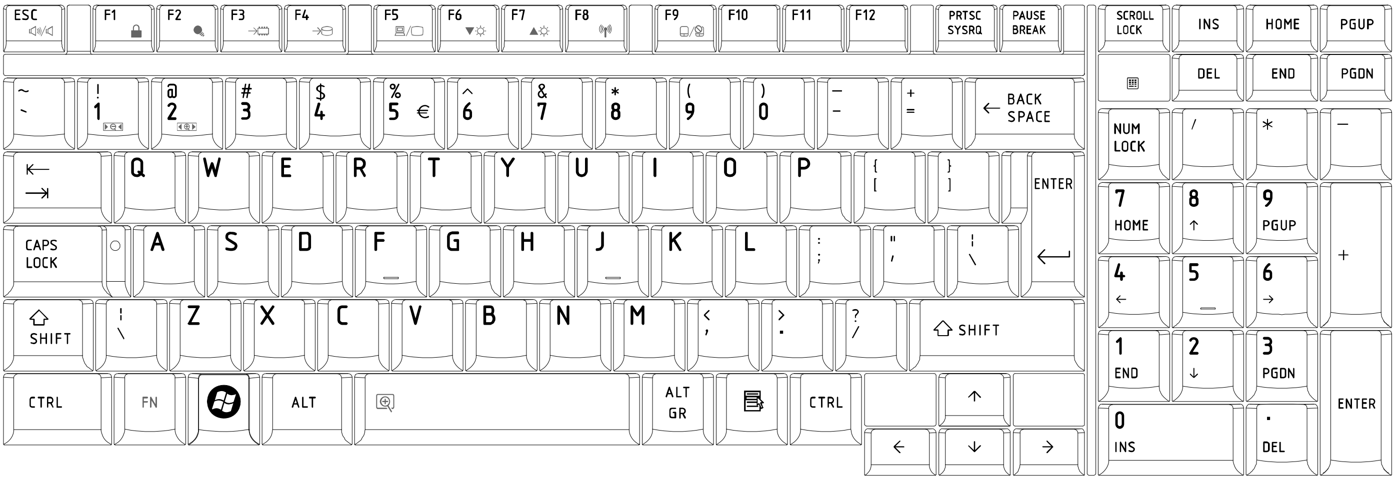


Figure UI keyboard

7. Hebrew (HB) Keyboard

Figure HB keyboard



8. Danish (DM) Keyboard



Figure DM keyboard

9. Swiss (SW) Keyboard

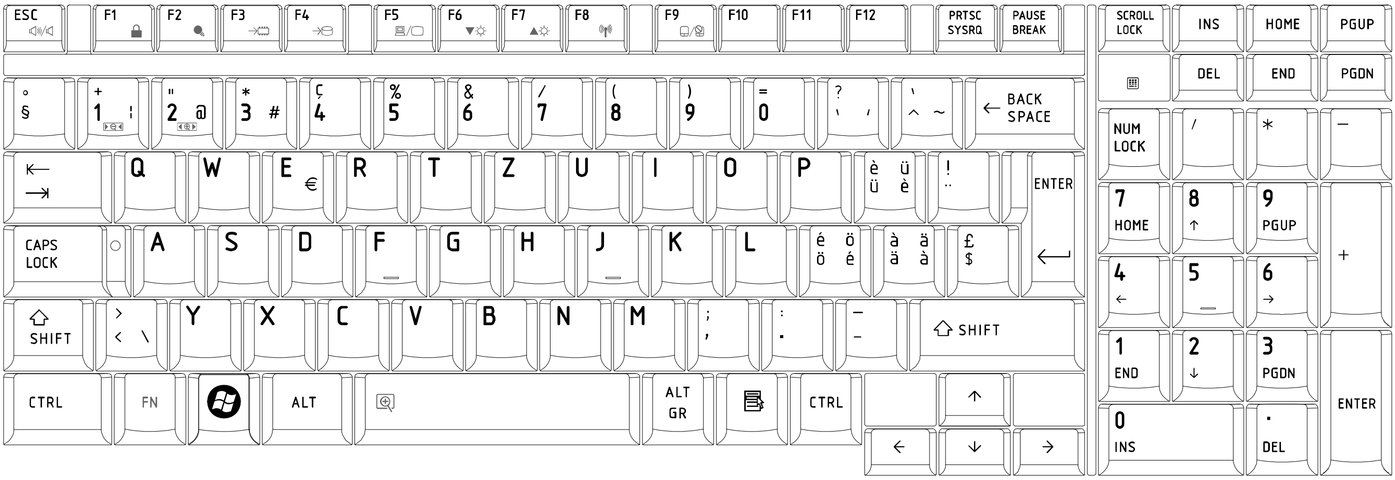


Figure SW keyboard

10.Arabic (ARE) Keyboard

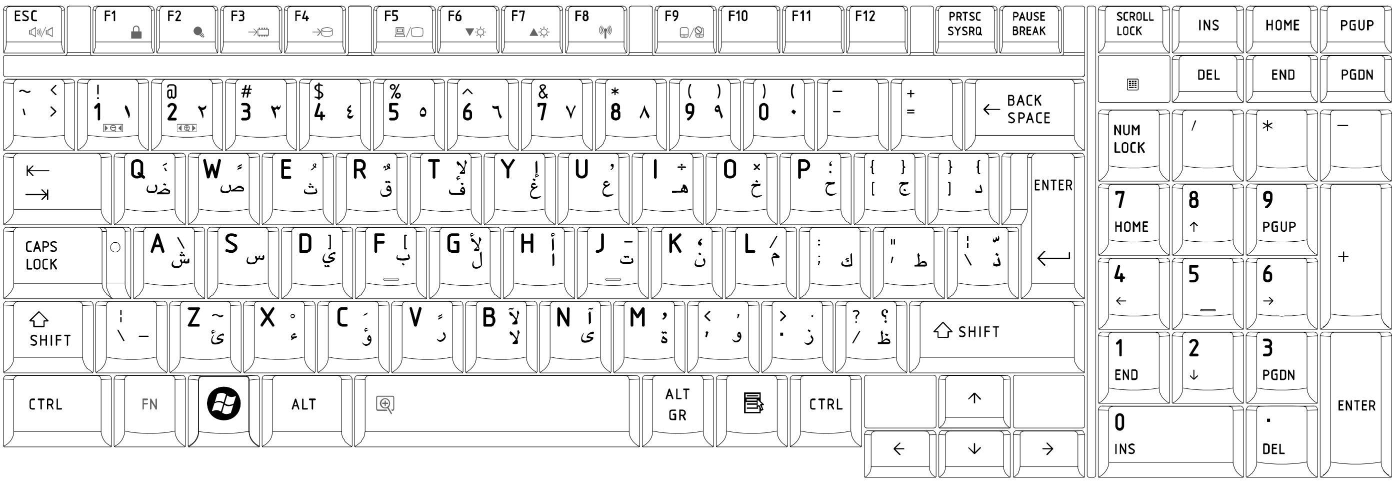


Figure ARE keyboard

11. Czech (CZ) Keyboard

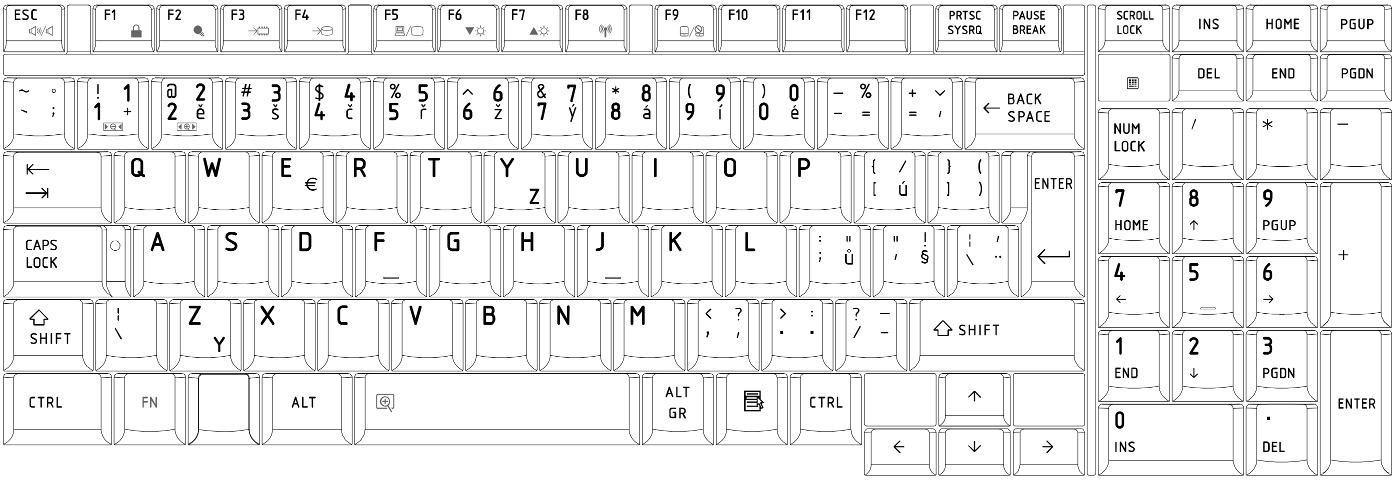


Figure CZ keyboard

12. Russian (RU) Keyboard

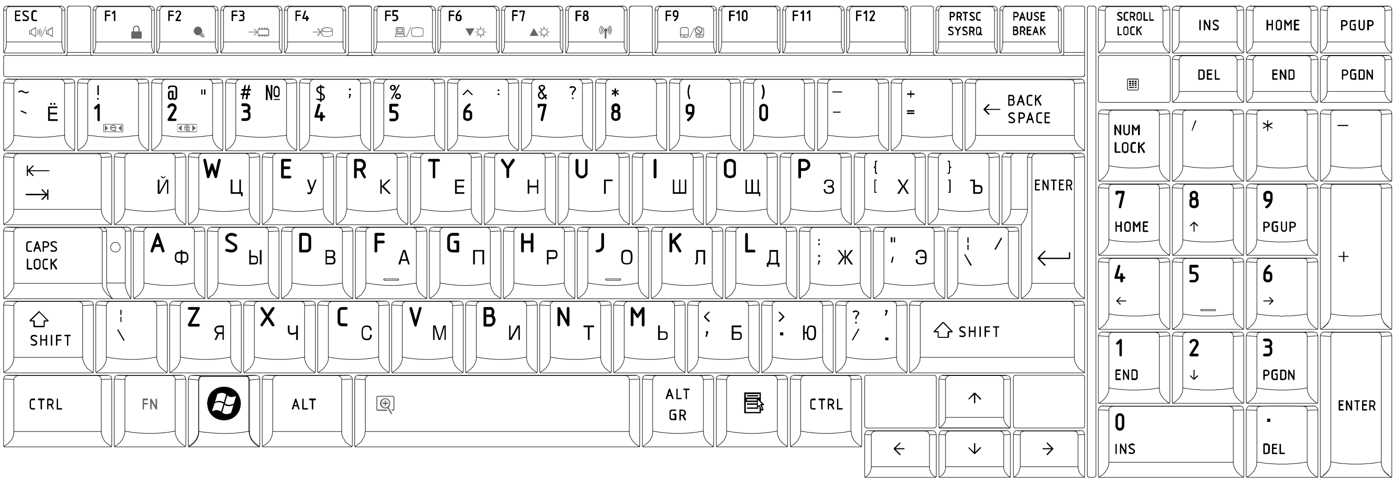
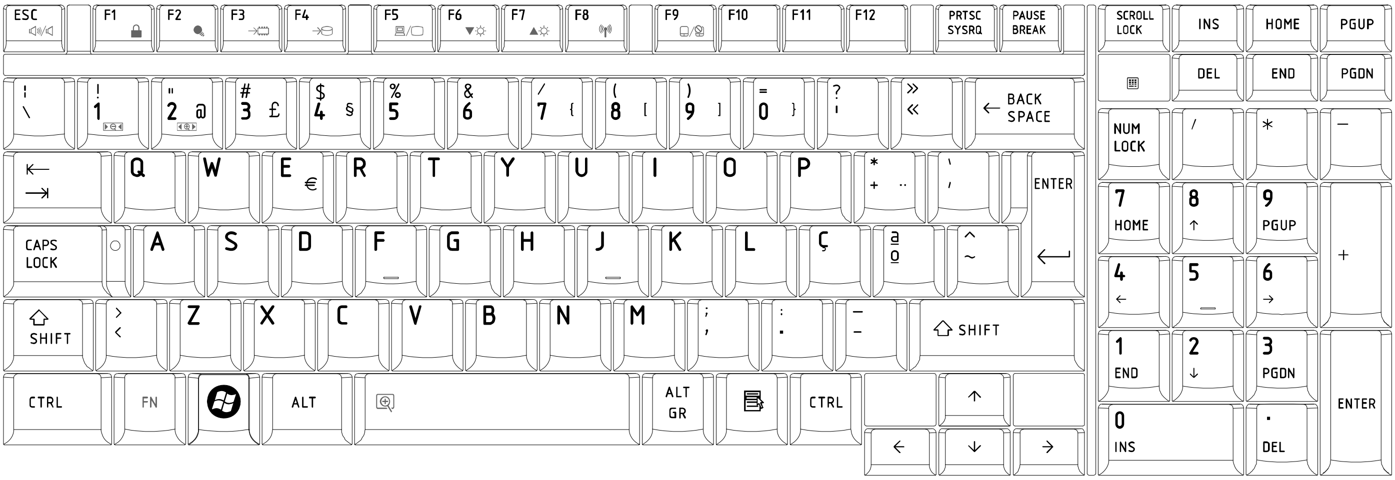


Figure RU keyboard

13. Portuguese (PO) Keyboard

Figure PO keyboard



14. Slovakian (SL) Keyboard

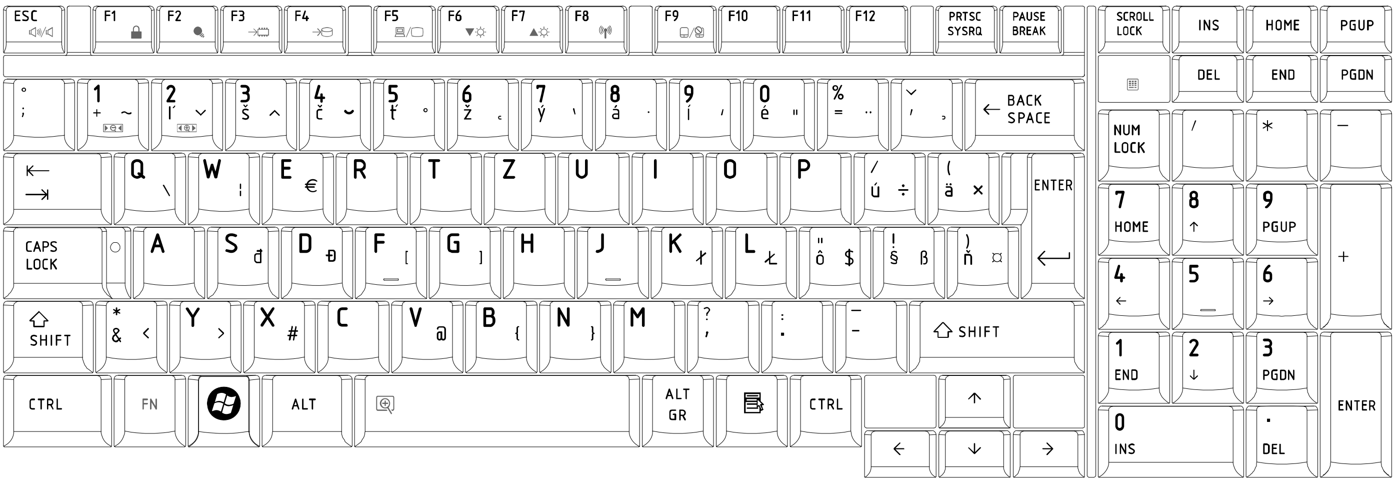


Figure SL keyboard

15. Italian (IT) Keyboard

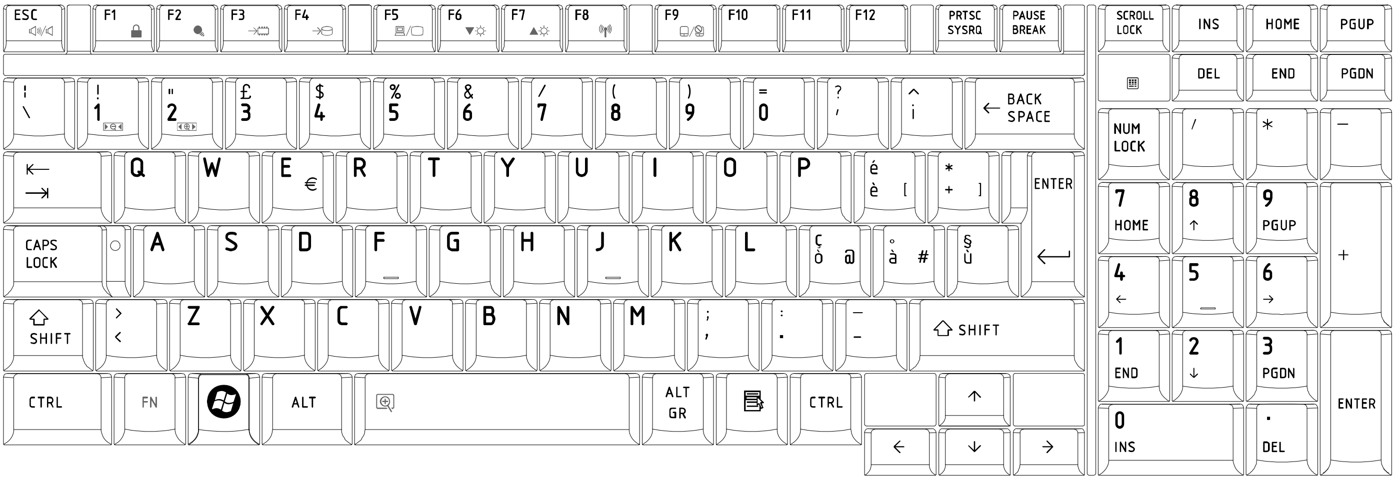


Figure IT keyboard

16. French (FR) Keyboard

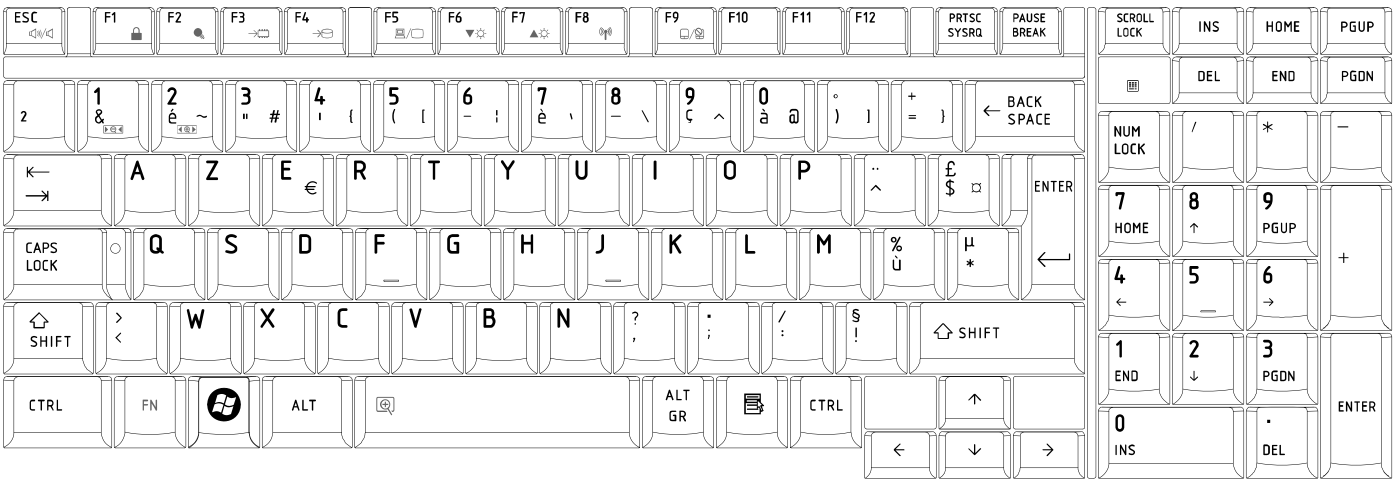


Figure FR keyboard

17. German (GR) Keyboard



Figure GR keyboard

18. Greek (GK) Keyboard

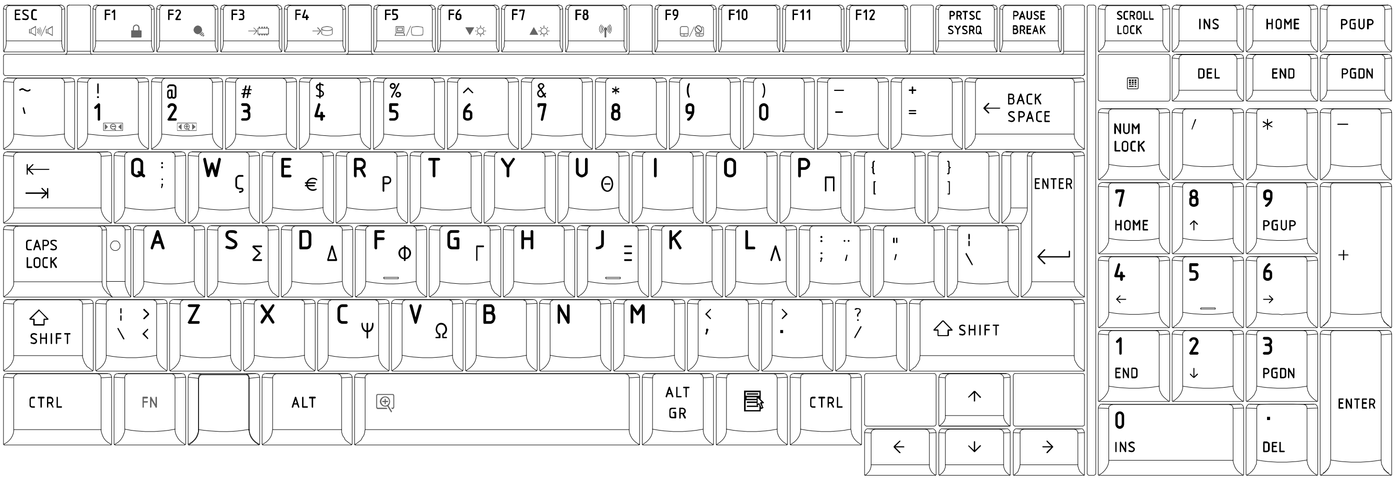


Figure GK keyboard

19. Hungarian (HG) Keyboard



Figure HG keyboard

20. Spanish (SP) Keyboard

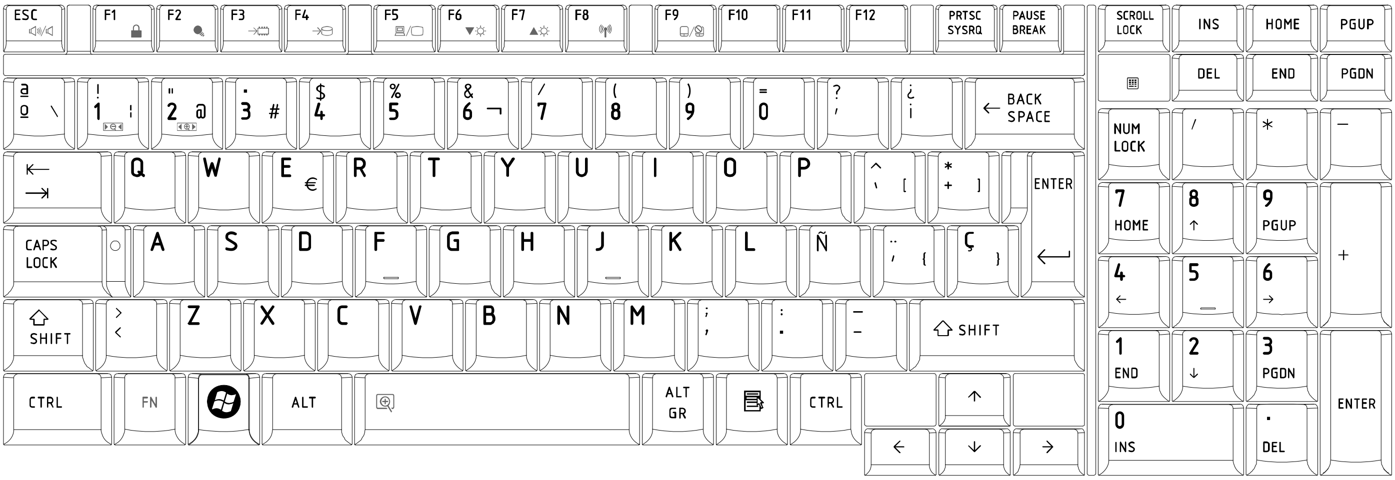


Figure SP keyboard

21. Turkish (TR) Keyboard



Figure TR keyboard

22. Turkish F (TF-F) Keyboard



Figure TF-F keyboard

23. Swedish (SD) Keyboard



Figure SD keyboard

24. Belgian (BE) Keyboard

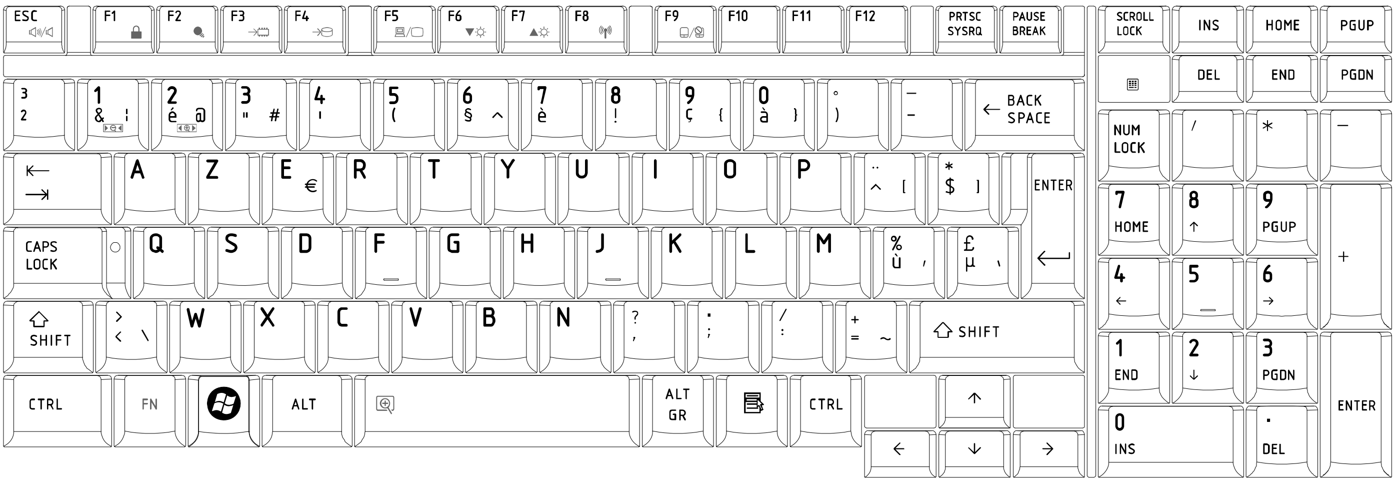


Figure BE keyboard

25. Yugoslavian (YU) Keyboard

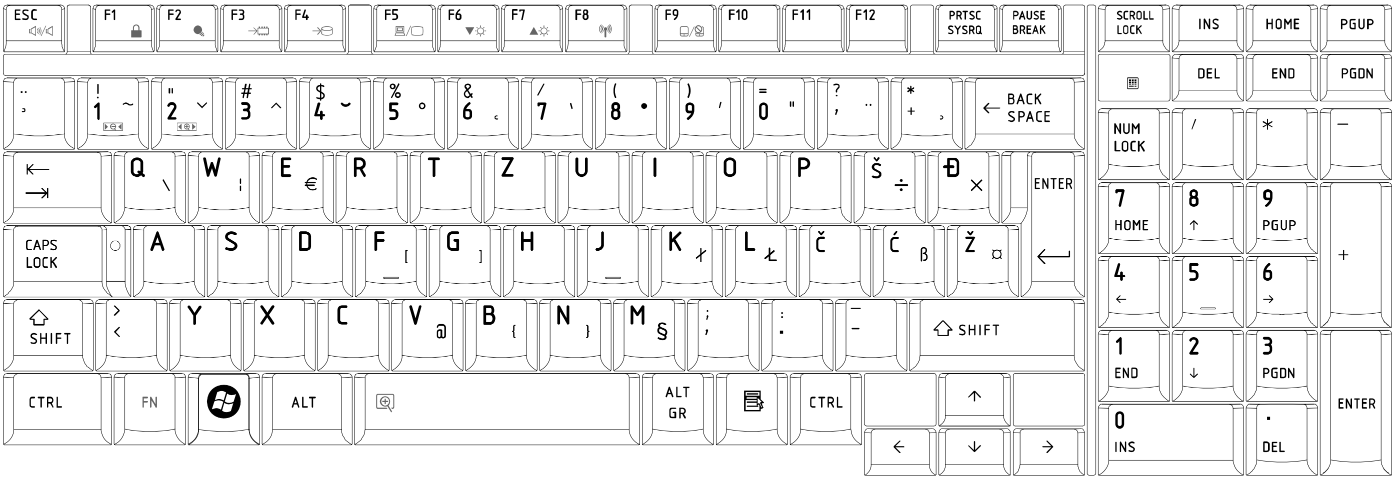


Figure YU keyboard

26. Norwegian (NW) Keyboard

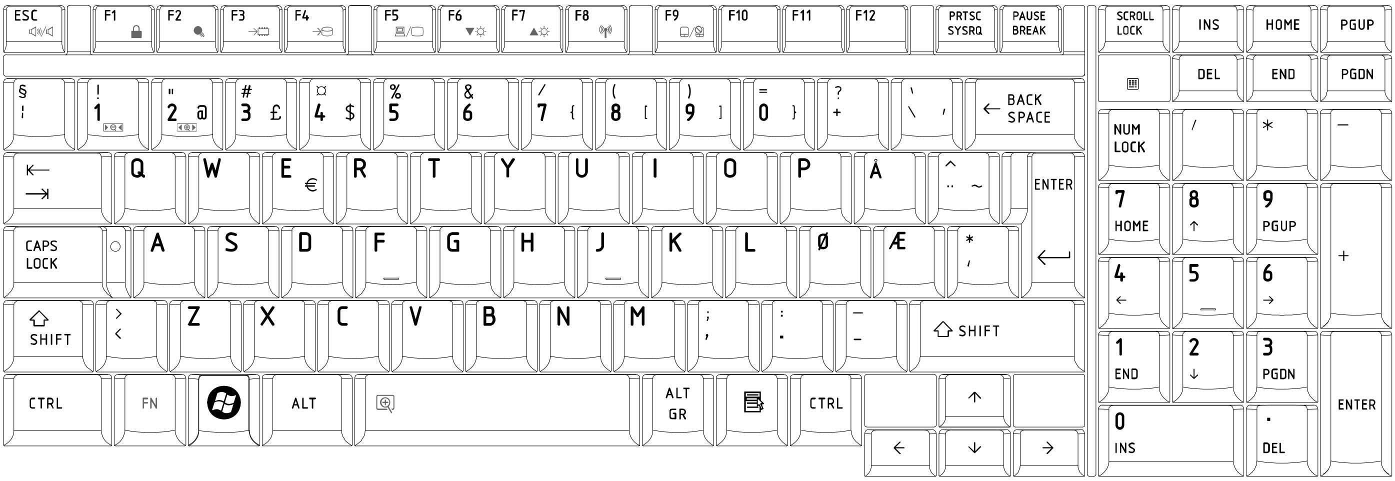


Figure NW keyboard

27. Scandinavian (ND) Keyboard

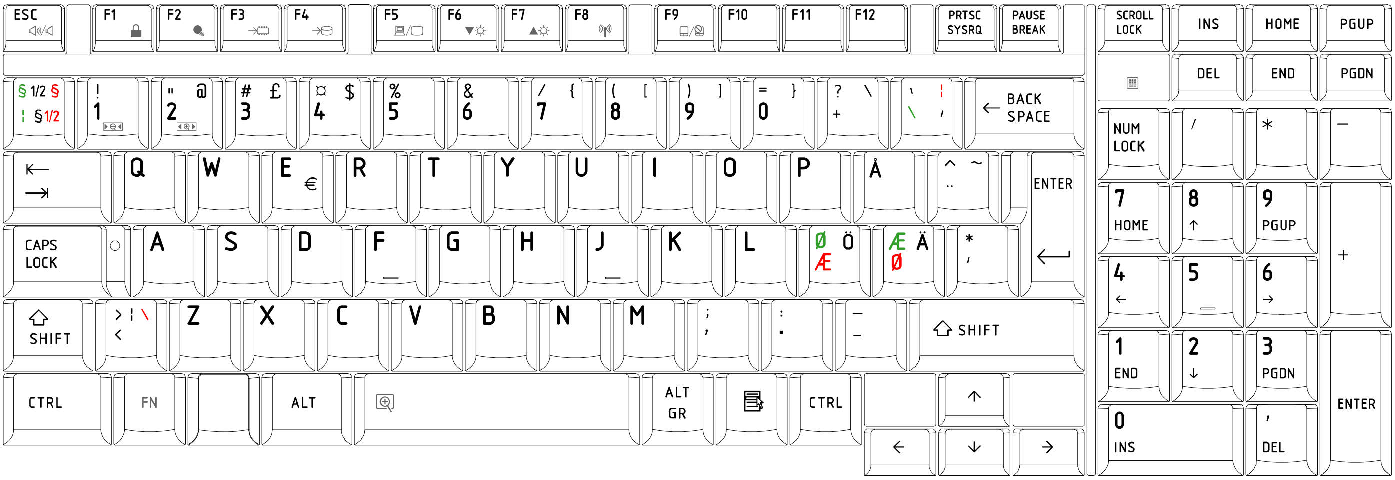


Figure ND keyboard

28. Canadian Multinational (AC) Keyboard



Figure AC keyboard

29. Canadian Bilingual (CB) Keyboard

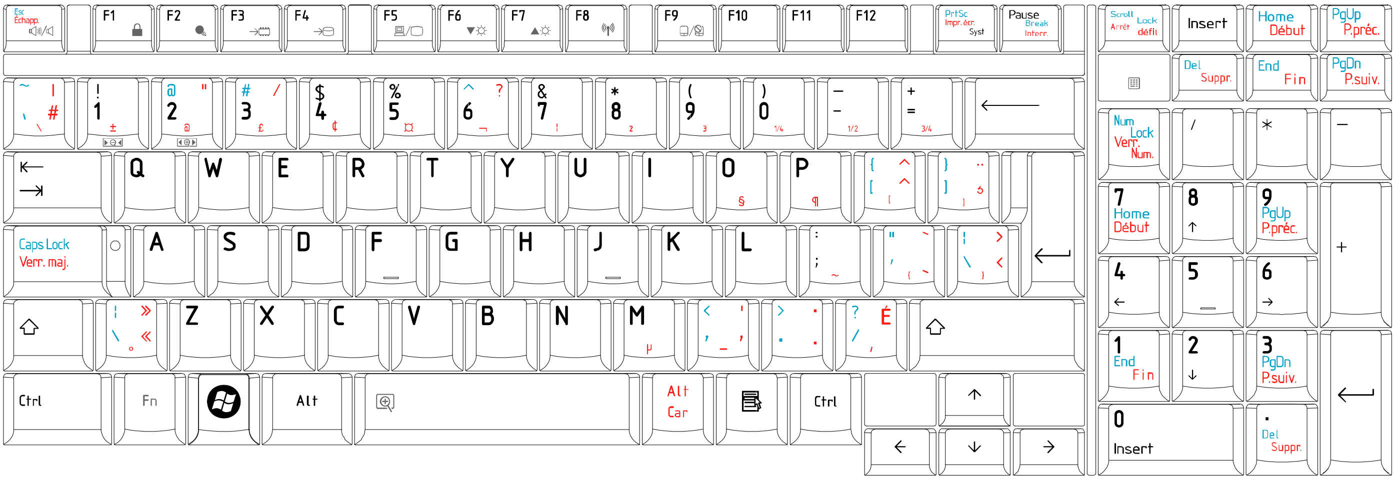


Figure CB keyboard

30. Japanese (JP) Keyboard



Figure JP keyboard

Appendix F Wiring Diagrams

F.1 RGB Monitor ID Wraparound connector

(1) RED	RED (1)
(2) GREEN	GREEN (2)
(3) BLUE	BLUE (3)
(4) NC	NC (4)
(5) GND	GND (5)
(6) GND	GND (6)
(7) GND	GND (7)
(8) GND	GND (8)
(9) 5V	5V (9)
(10) GND	GND (10)
(11) NC	NC (11)
(12) SDA	SDA (12)
(13) HSYNC	HSYNC (13)
(14) VSYNC	VSYNC (14)
(15) SDL	SCL (15)

Figure F-1 RGB Monitor ID Wraparound connector (15PIN to 15PIN)

F.2 LAN Loopback Connector

(1) BIBAP '(TX+)	(3) BIDBP (RX+)
(2) BIDAN (TX-)	(4) BIDBN (RX-)

Figure F-2 LAN loopback connector

Appendix G BIOS Rewrite Procedures

This Appendix explains how to rewrite the system BIOS program when you update the system BIOS.

Tools

To rewrite the BIOS, you need the following tool:

- ❑ BIOS/EC/KBC rewriting disk
- ❑ USB doggle

Rewriting the BIOS

1. Set the system to shut down mode.
2. Turn off the power to the computer.
3. Remove the external cables and cards.
4. Connect an external FDD and insert the BIOS rewriting disk into the external FDD.
5. Connect the USB doggle special for BIOS rewrite
6. Turn on the power
7. The BIOS rewriting starts.
8. When the process is completed, it beeps and the system automatically reboots.

NOTE: *1. Connect the AC adaptor to the computer when you rewrite the BIOS.*

2. Do not turn off the power while you are rewriting the BIOS.
If the rewriting fails, it might be impossible to start up the computer.

3. If you fail to rewrite BIOS, then when you next turn on the power, a message may be displayed that the contents of the BIOS have been erased or system can't be booted . In this case, insert the BIOS rewriting disk, and the BIOS will be rewritten.

Appendix H EC/KBC Rewrite Procedures

Same as BIOS rewrite Procedures, please refer appendix G

Appendix I Reliability

The following table shows MTBF (Mean Time Between Failures) in maximum configuration.

Table I-1 MTBF

Component	Time (hours)
System	6150